Physi Odyssey

Exploring Human Physiology

A creative writing journal with a physiology focus

Volume 1, Issue 1, 2025

journals.gla.ac.uk/PhysiOdyssey

Contents

Exploring Human Physiology

PhysiOdyssey · 2025 · Vol 1, No. 1, pp. i-iii
https://doi.org/10.36399/skjkmh97

Introducing PhysiOdyssey

Welcome to the inaugural edition of PhysiOdyssey! We are delighted to bring you this innovative new journal, which we hope will provide a space where physiological science and creativity meet to produce thought-provoking, engaging content.

PhysiOdyssey evolved from a hypothetical zine originally developed as part of Honours courses in Human Biology and Physiology at the University of Glasgow. For many years, final-year students on these programmes have been invited to submit essays for the Garry Prize. This prize was inaugurated in 1980 to celebrate the eightieth birthday of Robert Campbell Garry, who served as Regius Professor of Physiology at the University of Glasgow from 1947 - 1970. In addition to his research, he was a strong advocate for science communication. The Garry Essays have long encouraged a creative approach, asking students to think broadly about the applications of their physiological knowledge.

As we reviewed our core courses, we recognised that many of our students possess a wide range of talents and interests beyond their scientific specialisms. We also believe that creativity is vital to science, not only for generating new ideas but also for expressing and communicating them, both within and beyond the scientific community. Outside of specialist areas, not everyone connects with traditional scientific literature. We wanted to offer something different: a way to explore physiology through narrative, imagination, and artistic expression.

As avid readers, we have both enjoyed ‘learning by stealth’ — absorbing scientific ideas through fiction, storytelling, and popular science writing — although we have sometimes been frustrated by superficial or inaccurate portrayals of science in literature. We began to wonder how we might bring the spirit of unexpected learning into our teaching. That question sparked the idea of a class zine, in which students could explore their understanding of physiology in creative and unconventional ways.

To support the students, we invited a creative writer into our science classroom to share techniques and alternative viewpoints. Students were then invited to write pieces for a zine we named BioOdyssey, a title chosen to reflect the idea of a surprising and adventurous journey through the topics covered in the Human Biology and Physiology programmes. The quality of student work was so high that we felt compelled to bring the zine into a more formal setting, focusing on Human Physiology, our specialist subject. In fact, ‘Leading Physician Makes Medical Breakthrough’, featured in this edition, won the Garry Prize for

Human Biology students this year. Similarly, ‘Withering,’ ‘The Pulse of Emotion’, and ‘Letters Inherited’ were all developed from Garry Essay submissions.

Bringing PhysioOdyssey to life has been a team effort. We are grateful to our editorial team, who found time in their busy schedules to review submissions and help shape the ethos of the journal. Particular thanks go to our two student interns, who have been instrumental in maintaining our social media presence and contributing throughout the editorial process.

We are immensely grateful to all our contributors. Without your creativity and generosity, there would be no PhysiOdyssey. The pieces selected for this first edition set the tone for what we hope will be a vibrant and stimulating journal.

Our journal is especially aimed at students and novice writers. It offers a platform for new voices and a space to step beyond comfort zones, whether by experimenting with a new writing style or exploring physiology from a fresh perspective. We welcome submissions from writers of all backgrounds and aim to make PhysiOdyssey an inclusive space for diverse voices and perspectives. It is not necessary to have a background in physiology to submit - an interest in creative expression on physiological themes is all that is required. However, we do ask that all submissions have a clear physiological focus, and that a short scientific statement is provided to outline the current understanding of the topic. We see PhysiOdyssey as place for development and we are happy to work with contributors to help shape and refine their submissions. We can also provide advice and guidance for preparing scientific statements.

While we are particularly keen to publish narrative formats such as short stories and imagined letters, diary entries, or newspaper articles, we also aim to curate a diverse and inspiring collection of work. This edition includes poetry, and in future issues we would like to include forms such as graphic narratives, and visual art. We will consider any format that brings physiology to life in new and unexpected ways.

To support and inspire writers, we have created a series of writing prompts, available on our website. These are designed to spark ideas and encourage exploration of physiology through creative lenses. Feel free to use these for your own writing practice, or as a starting point for a submission. If you are inspired to contribute, submission guidelines are available on our website.

And finally, to you, our readers: welcome! You are just as important to us as our writers. We hope you find something in these pages that inspires you, sparks curiosity, or encourages you to explore further. Human physiology is, after all, the science of our lives, and it touches every one of us. Ultimately, our goal is to make human physiology accessible, engaging, and relevant to a broad audience. We want to put some fizz into physiology - hence the ‘bubbles’ in our logo.

Thank you for finding PhysiOdyssey. We hope you enjoy reading this first edition as much as we enjoyed bringing it to life.

Katherine Price and Shona McQuilken

Managing Editors

PhysiOdyssey
Exploring Human Physiology
PhysiOdyssey · 2025 · Vol 1, No. 1, pp. 5-7
https://doi.org/10.36399/wzd4nf29

Withering

By Ilona Bladworth

My dad is a strong man, physically and emotionally. He is kind, devoted, and he would do anything to protect us. His sallow skin enrobes a glorious forest of cells that collaborate to give him his strength. His brain dispatches information to his muscles along chains of cells called neurons. Everything he does requires this complex network to work synchronously. Dad is an avid gardener, nurturing a myriad of greenery at the back of our house. Easily my favourite, and the oldest of all the plants, is a burly lime tree that stands in the far-left corner of the lawn. He used to lift me onto his shoulders so I could pick fruit from the laden branches, and dotingly teased as I would wince at the tartness of the harvest of our labour. He still tends to his Eden just as fervently into his sixties; in fact, I think the only things he loves more than gardening are his children.

●●●

Light creeps in through the blinds, which cast still shadows onto the kitchen wall. I have become acutely aware of the sound of my own breathing, no one says anything. My dad has just told us that he has been diagnosed with motor neuron disease. The only thing I know about this condition is that the life expectancy is short — very short. He tells us that he has been referred to a specialist who will provide him with physical, psychological and emotional support, and who will be visiting the house in the next few days. He smiles softly at us and tells us that everything is going to be fine. Everything does not feel fine.

The specialist is a man called Dr. Ward. He has a grey beard and smells of antiseptic. He perches on a chair at the kitchen table and tells us that our dad is suffering from the most common motor neuron disease, amyotrophic lateral sclerosis or ALS. I flinch at the words ‘neurodegenerative disorder’ which he explains means that the nerves controlling Dad’s movements will continue to degrade over time. The long trunk-like axons of the cells will wither and die in his brain and spinal cord. I glance at my dad; his face is soft and his eyes untroubled as he nods gently. There is a knot in my chest, vines tightly wind themselves around my heart as the droning voice of the doctor is obscured by the sound of blood pumping in my ears.

After Dr. Ward’s first visit things start to make sense: why Dad would mention aches in his legs, why he struggled to open doors and why he had started to become increasingly clumsy — tripping over most days on his way out to the garden. He tends to laugh these instances off, pulling a face to make us laugh, and berating himself jokily for being so uncoordinated, but I can tell it's getting harder for him to do all the things he once found effortless. His immune system, the part of his body that should be protecting him, fighting on his side, has decided to launch an inflammatory attack on his nerves like a burning forest fire. He sits outside every day, and I recognise that it hurts him not to be able to water, weed, and prune his garden. As the air cools, the lime tree wilts and the fruits that were once a vibrant green, shrink and fall, rotting on the grass next to his lawn chair.

Porridge sits on the stove this morning, as it has most days recently; the only foods that Dad can eat are soft or pureed, lots of mashed potato and soup. The muscles he needs for chewing and swallowing, being skeletal, voluntary muscles, are declining. We all sit and eat at the table, family breakfasts, lunches and dinners; the only sound tends to be Dad's cutlery dragging shakily across his plate. He refuses any help with eating, saying he is feeling "very capable" at any offer, but his muscles are wasting as his nerves lose the power to send any signals to them and any tone they once had has diminished. His skin sags around his upper arms and thighs, unable to keep up with the loss of muscle mass. He struggles to bear any weight at all, an empty mug is about all he can manage; he can't even have tea anymore because Dr. Ward has warned that he could choke on anything as his mouth and throat muscles weaken. He said it was called bulbar degeneration and his words, "nothing too solid, nothing too liquid", discordantly echo in the kitchen. I hate porridge now.

I have been floating above my body every day since Dad's diagnosis, I feel hollow and the late autumn breeze rips right through me as I stand at the back door. I stare into the garden where I once ran, jumped and played, where my dad would hold my hands and spin me around, where my ribs would let my lungs breathe, where any tension would be replaced with laughter, and where I didn't need to consider why the branches of my dad's nervous system were breaking down. The uncertainty consumes me, even ALS experts can't say what is going on in his brain, their theories offer me little comfort. They say it's likely due to an excess amount of a chemical called glutamate, making nerve cells fire signals too often causing a buildup of toxic products that are killing his cells. I sway on the threshold. This thought makes me feel sick. The unmown grass seems to mimic me in the wind, ripples moving across it like a choppy sea. My dad is inside. Due to the nerve damage, his leg muscles have lost contact with his brain. No longer able to plant his feet on the ground, he stays in the house with constant nausea from his medication. The living room has become his bedroom as he can't get up or down the stairs. I smile as I walk in to see him, wrapped up in blankets in bed. I sit down softly next to him, and his warm, woody smell pricks the back of my eyes. My cheeks are suddenly sodden with tears, Dad reaches his hand out slowly and I can tell he is trying to squeeze mine as he holds it. He can't speak anymore — the thought makes me ache — but he smiles tenderly, and he is my dad again.

The lime tree's bark has turned pale and brittle, its spindly branches are barren and seem to be grasping for air. Maybe they, too, need a machine to breathe, a mask and tubes and a whirring box to stimulate the rise and fall of the lungs. Until even that cannot keep up with the demand for oxygen anymore.

●●●

I have been putting off sorting my dad's things for months since the funeral, I feel raw as I walk into his room. I draw a deep breath into my chest and start on his bedside table and chest of drawers. Opened boxes of pills litter all the surfaces, their efforts to prevent the overwhelm of chemical toxicity couldn't keep Dad with me for more than a year. I wish that he had been granted more time to empty the boxes of pills. I make the bed, allowing myself to lay for a second on the blanket as I breathe in the soft woody scent that reminds me so much of him.

I stand up shakily and gently run my hand along the battered spines of the old books on his shelf. There is only one without tattered corners. I carefully slide it out and flick through the pristine pages — empty — there is only one page with any words. My dad's writing, still crisp and clear and so unlike what it had become after damage to the nerves controlling his fine motor skills caused his hands to twitch and tremor. A lump grows in my throat as I read the words "I'm scared of dying, I don't want to go yet" — suddenly the dad who was so indomitable, becomes so much more vulnerable in my eyes. It was all a façade.

My dad was a strong man, physically and emotionally. He was kind, and devoted and he did everything to protect us even when his body couldn't protect him.

Scientific Statement

'Withering' is a piece of creative writing about Amyotrophic Lateral Sclerosis or ALS, a condition that causes severe damage to nerve cells that control the body's movements. These nerves are called motor neurons — they transport information from the central nervous system to the muscles, allowing the body to move. Because ALS damages the motor neuron cells, the muscles become weaker as they can't receive any signals from the brain, and the person with ALS eventually loses control of all functions in their body, including eating and breathing. There are many different types of these conditions — they are known as motor neuron diseases — ALS being the most common among them. It is a progressive, degenerative disorder, which means that the damage it causes is irreversible and worsens over time. ALS is a terminal condition with no known cure; life expectancy after diagnosis is around two to five years and the condition worsens quickly causing severe disabilities. There is currently no cure for ALS, however there are therapies that target its symptoms, aiming to improve life quality and slow the progression of the disease.

Bibliography

Blasco, H., Mavel, S., Corcia, P. and Gordon, P.H. (2014). The Glutamate Hypothesis in ALS: Pathophysiology and Drug Development. Current Medicinal Chemistry, 21(31), 3551–3575. https://doi.org/10.2174/0929867321666140916120118

Feldman, E.L., Goutman, S.A., Petri, S., Mazzini, L., Savelieff, M.G., Shaw, P.J. and Sobue, G. (2022). Amyotrophic lateral sclerosis. The Lancet [online], 400(10360), 1363–1380. https://doi.org/10.1016/S0140-6736(22)01272-7

Grad, L.I., Rouleau, G.A., Ravits, J. and Cashman, N.R. (2017). Clinical Spectrum of Amyotrophic Lateral Sclerosis (ALS). Cold Spring Harbor perspectives in medicine [online], 7(8), p.a024117. https://doi.org/10.1101/cshperspect.a024117

Mayo Clinic (2019). Amyotrophic Lateral Sclerosis (ALS) [online], Mayo Clinic. Available at: https://www.mayoclinic.org/diseases-conditions/amyotrophic-lateral-sclerosis/symptoms-causes/syc-20354022

McCarty, E.B. and Chao, T.N. (2021). Dysphagia and Swallowing Disorders. Medical Clinics of North America, 105(5), pp.939–954. https://doi.org/10.1016/j.mcna.2021.05.013

The ALS Association. (2024). Disease Mechanisms. [online] Available at: https://www.als.org/research/als-research-topics/disease-mechanisms

Exploring Human Physiology
PhysiOdyssey · 2025 · Vol 1, No. 1, pp. 5-7
https://doi.org/10.36399/wzd4nf29

A Microbial Ballad: The Gut's Tiny Friends

By **Helen Godefroimont**

Deep in the gut, where few can see,
A world of microbes thrives in glee.
Through twists and turns of the GI tract,
They shape our health—that's just a fact!

Ruminococcus, king of the grain,
Prefers artichokes—not in vain!
Breaking down pectin with careful might,
Releasing butyrate—a neuro delight.

Lactobacillus, sour yet wise,
Modulates serotonin's rise.
With tryptophan, it crafts the key,
A calmer mind, less anxiety.

Akkermansia, sleek and slim,
Toughens gut walls to keep things in.
Less endotoxin, less brain fog,
A shield against the leaky clog.

Faecalibacterium, gentle guide,
Soothes inflammation far and wide.
Its butyrate fuels microglia's grace,
Clearing debris in neural space.

Bifidobacteria, early friend,
Shapes immunity to defend.
With GABA's touch, it steers the tide,
Easing stress from deep inside.

So next time you eat, give thanks and cheer,
For microbes working far and near.
From gut to brain their whispers weave,
A symphony we must believe!

Scientific Statement

This piece is inspired by working with pre- and probiotic compounds during my Honour's project. It aims to give life to select gut bacterial genera, rather than providing an exhaustive list, as many strains share overlapping roles. To enhance readability and maintain rhyme, each paragraph highlights only certain key actions of a given genus. By anthropomorphizing these microscopic allies, I hope to bring their efforts to life and emphasize the deep interconnection between the gut microbiome and the brain. This work serves as a reminder of the vital role our gut bacteria play in maintaining our health—especially through the gut-brain axis. I hope it inspires appreciation for these tiny yet powerful companions that help shape our well-being! Be grateful for this beautiful symbiotic relationship.

Bibliography

Ruminococcus can help release butyrate

Sasaki, M., Schwab, C., Ramirez Garcia, A., Li, Q., Ferstl, R., Bersuch, E., Akdis, C. A., Lauener, R., Frei, R., Roduit, C., Bieber, T., Schmid-Grendelmeier, P., Traidl-Hoffmann, C., Brüggen, M. C., & Rhyner, C. (2022). The abundance of *Ruminococcus bromii* is associated with faecal butyrate levels and atopic dermatitis in infancy. *Allergy, 77*(12), 3629–3640. https://doi.org/10.1111/all.15440

Lactobacillus can modulate serotonin production

O'Mahony, S. M., Clarke, G., Borre, Y. E., Dinan, T. G., & Cryan, J. F. (2015). Serotonin, tryptophan metabolism and the brain–gut–microbiome axis. *Behavioural Brain Research, 277*, 32–48. https://doi.org/10.1016/j.bbr.2014.07.027

Akkermansia can strengthen the gut barrier

Ottman, N., Reunanen, J., Meijerink, M., Pietilä, T., Kainulainen, V., Klievink, J., Huuskonen, L., Aalvink, S., Skurnik, M., Boeren, S., Satokari, R., Mercenier, A., Palva, A., Smidt, H., de Vos, W. M., & Belzer, C. (2017). Pili-like proteins of *Akkermansia muciniphila* modulate host immune responses and gut barrier function. *PLoS ONE, 12*, e0173004. https://doi.org/10.1371/journal.pone.0173004

Faecalibacterium can soothe inflammation and produce butyrate

Zhang, M., Zhou, L., Wang, Y., Dorfman, R. G., Tang, D., Xu, L., … & Yu, C. (2019). *Faecalibacterium prausnitzii* produces butyrate to decrease c-Myc-related metabolism and Th17 differentiation by inhibiting histone deacetylase 3. *International Immunology, 31*(8), 499–514. https://doi.org/10.1093/intimm/dxz022

Bifidobacteria can strengthen immunity and aid GABAergic signaling

Ruiz, L., Delgado, S., Ruas-Madiedo, P., Sánchez, B., & Margolles, A. (2017). *Bifidobacteria and their molecular communication with the immune system. Frontiers in Microbiology, 8*, Article 2345. https://doi.org/10.3389/fmicb.2017.02345

Kim, J., Kim, Y., Lee, H., Jin, H., Neupane, C., Kim, S., Lee, S., Min, J., Sasai, M., Jeong, J., Choe, S., Kim, J., Yamamoto, M., Choy, H., Park, J., & Jo, E. (2018). GABAergic signaling linked to autophagy enhances host protection against intracellular bacterial infections. *Nature Communications, 9*, Article 64 87. https://doi.org/10.1038/s41467-018-06487-5

Exploring Human Physiology

PhysiOdyssey · 2025 · Vol 1, No. 1, pp. 8-14
https://doi.org/10.36399/tem23w95

Leading Physician Makes Medical Breakthrough

By Asha Waugh

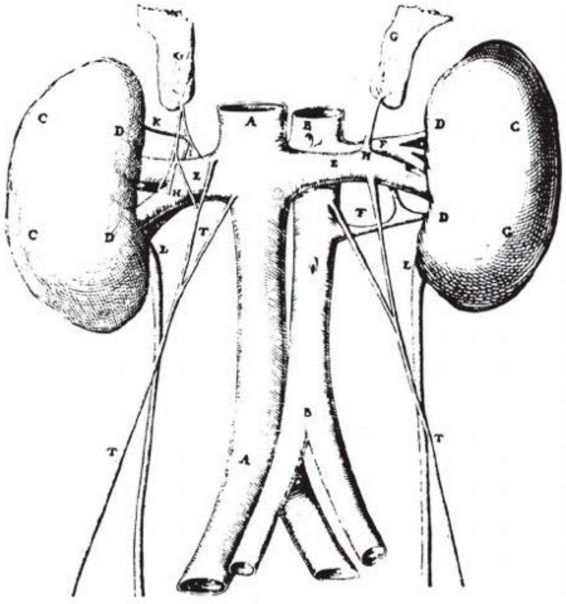
In a recent monograph, Thomas Addison defied popular belief and revealed that the suprarenal glands can indeed be afflicted by disease, proving that they must have a vital physiological function.

1. Photograph of Thomas Addison

Dearest reader, I invite you to envisage yourself standing outside the door behind which one of the greatest physicians of our time sits. You have spent days frantically corresponding with the staff at Guy's Hospital, London, and upon a chance cancellation, urgently travelled the length of the country for an interview, lest the opportunity be snatched by another. The idea that you are really there feels surreal — your heart beats rapidly against your chest, your hands shake with a peculiar mix of nervousness and excitement, and your stomach churns. All natural physiological responses, yet this knowledge does little to calm your racing mind. *What is he like? What should I ask? What am I even doing here?!*

Perhaps you have already guessed, but this was precisely my predicament a mere week ago. Reader, I shall end your suspense, for behind this old oak door sat the great physician and medical researcher, Thomas Addison.

For those who may be unaware, Addison has recently made the most remarkable identification of failure of the suprarenal glands, which are small triangular structures located on the top of each kidney. These glands were first identified in 1564 by Bartolomeo Eustachius; however, his discovery wasn't recognised by his contemporaries, who instead proposed that the structures were rare congenital outgrowths. Or, that they simply existed to support the nerves that descend from the ribs to the mesentery (a tissue that supports the digestive organs in the abdominal cavity). Eventually, Eustachius’ findings began to be accepted, particularly after several anatomists made the shocking discovery of a cavity within the gland filled with "black bile", which in 1836 was documented as the separation between the cortex and medulla of the suprarenal glands. Several theories pertaining to the function — if there even was any — of the suprarenal glands began to emerge. It may seem laughable now, but one such theory speculated that because the suprarenal glands seemed to appear larger during foetal development, they could serve the function of returning foetal blood to the mother’s circulation for excretion. However, it wasn’t until now, thanks to the diligent work of Addison, that the physiological importance of the glands has finally been recognised. This brings us back to the present.



2. Diagram of kidneys

Realising that I had begun to receive curious looks from passersby, I knocked twice before pushing the great wooden door open to reveal a rather stuffy, dimly lit room. Each wall was lined from floor to ceiling with books, occasionally broken up by oddities such as weathered skulls and jars containing an assortment of organs. The familiar scent of burning candles and old paper filled the air and I could hear the furious scribbling of pen on paper. I followed the source of the sound, leading my eyes to a desk positioned towards the back of the room. Pages upon pages of anatomical drawings and corresponding notes lay strewn across the desk, providing me a brief glimpse into Addison’s mind. The man in question looked up from his work, appearing deep in thought. "You must forgive my staring" I said, slightly embarrassed as I took my seat at the desk, "It’s just that I’ve never seen anything of the sort!". He chuckled and as my eyes finally adjusted to the light, I took note of his defined, finely proportioned features. He exuded an air of pride and confidence, yet I felt there was something else hidden behind this haughty exterior. I introduced myself and extended my arm across the desk for a handshake. His grip was strong and steady, but his eyes didn’t quite meet mine and I began to sense a certain shyness about his character. As I reclined back in my seat, he offered me a cup of tea which I gratefully accepted. Addison poured the piping hot tea from the pot as I dug out my trusty leather-bound notebook from my travel case and commenced the interview.

"Perhaps we can begin," I said tentatively, "by telling me of your early life, and what shaped the path you were to follow."

Addison gave a slight cough and leaned forward in his creaky chair.

"Well, I was born in Longbenton, Newcastle, and was fortunate enough to attend Newcastle's Royal Free Grammar School. My parents were determined to give me the greatest possible education, for which I am eternally grateful." He gazed to the side as he said this, the candles flickering and casting dramatic shadows across his face.

"Which studies particularly inspired you?" I interjected.

"Well, I found Latin challenging and rewarding– I suspect my father fancied me a career in law," he jested, "However, I had my own calling and enrolled at the University of Edinburgh Medical School in 1812. Quite a step for a young lad from Longbenton!"

It was here that Addison wrote his thesis on syphilis, with a particular focus on the use of mercury pills in its treatment. Upon graduation, he became a house surgeon at London Lock Hospital and a pupil at the Public Dispensary. A subtle sparkle appeared in Addison's deep hazel eyes as he described his work under the tutelage of dermatologist Thomas Bateman, adding that it instilled in him "a passionate and longstanding interest in diseases of the skin". His time at London Lock Hospital came to an end when he was offered a position as a physician pupil at Guy's Hospital in 1817. "How could one refuse?" he asked while laughing. Seven long years later, his licence was granted and the very same year he founded the Department of Dermatology at Guy's. Addison declared: "it was then that I knew what I must devote my life to".

3. Guy's Hospital c.1820

Addison was appointed a lecturer in 1840 and was praised for his brilliance, though he seemed hesitant to accept this idea during our interview. His cheeks slightly flushed, he confided that he suspected his colleagues found it difficult to take a liking to him. Nevertheless, his lectures always saw excellent turnout amongst medical students. Addison's principal research at the hospital surrounded pneumonia and appendicitis but his discoveries often attracted scepticism. However, earlier this year Addison published his most well-known work to date, *On Disease of the Supra-renal Capsules,* cementing his space

4. Addison's post-mortem sketch of "Mr S.", taken from his 1855 monograph

in medical research. It was this monograph that proved that the suprarenal glands do indeed serve a vital role in normal physiology. Addison leaned further forward and continued, his energy building as his speech tempo increased and his gestures became more animated. The doctor, who often spent hours at the bedside of his patients, explained that he noticed ten particular cases in which patients with anaemia had a "feebleness of the heart, irritability of the stomach, and a peculiar change of the colour in the skin occurring in connection with a diseased condition of the suprarenal capsules". In his book he states that contrary to popular belief that the suprarenal glands are innocent of any diseases, they could in fact be "affected in such a way as to produce a fatal malady". It should not be forgotten that during these studies, Addison also discovered a type of anaemia now called Addison's anaemia. Since these ground-breaking discoveries, Addison has been commended for his devotion to the diagnosis of difficult diseases and his remarkable attention to detail.

The exact physiological function of these glands remains to be determined but these findings have certainly spurred the search. Shortly after Addison's monograph was published, Alfred Vulpian, a French neurologist and physician, began investigating the function of the glands. In recent statements, Vulpian has admitted to discovering the presence of secretory granules in the suprarenal medulla — a surprising twist indeed! However, this work is yet to be published, and Addison informs me that it is likely that a great deal more research will need to be conducted in order to fully understand these intriguing glands and their associated ailments. As our conversation drew to an end, Addison withdrew back into himself, regaining a cool composure. I thanked him for his time but as I gathered my belongings he muttered, "It is really you that I should be thanking." After questioning, he confided that recent breakdowns in his health had caused him a considerable loss of excitement about his profession but that nothing soothes him better than the interest in his work shown by myself and his students. Curious, yet not wanting to press the personal matter, I expressed my gratitude once again for this opportunity and opened the great old door for a final time. It is uncertain what the future may hold for Addison, as is ever the case, but one can be sure that his name and his work will be remembered throughout history.

Addendum

Dr Thomas Addison committed suicide on June 29, 1860, after suffering many years of melancholia. He was laid to rest at Lanercost Abbey, Cumberland.

5. *Lanercost Abbey*

Scientific Statement

The ‘suprarenal glands’ are now referred to as the adrenal glands. The adrenal glands are two endocrine organs situated on top of each kidney. They are involved in a variety of functions including stress responses, blood pressure control, and metabolism. Each gland is comprised of the adrenal cortex, which synthesises steroid hormones, and the adrenal medulla. The adrenal cortex is further divided into the zona glomerulosa (mineralocorticoid synthesis), zona fasciculata (glucocorticoids), and the zona reticularis (androgens). The adrenal medulla is involved in the production of catecholamines such as adrenaline (epinephrine).

The first accounts of adrenal insufficiency were produced by Thomas Addison who described the symptoms and the changes to the adrenal glands. While the majority of these patients had tuberculosis or tumours, one had ‘idiopathic’ adrenal atrophy which is now called Addison’s Disease. In the modern day, the leading cause of Addison’s Disease is an autoimmune condition where the immune system attacks the adrenal cortex. This is a rare disorder in which patients have antibodies against the steroidogenic enzyme 21-hydroxylase, resulting in a diminished ability to synthesise mineralocorticoids and glucocorticoids. It is thought to be caused by a complex interplay between genetic and environmental factors. Symptoms include nausea, fatigue, dizziness, and hyperpigmentation of the skin (which was noted by Addison). Patients are treated with hormone replacement therapy. If left untreated, patients may suffer acute adrenal insufficiency (or an adrenal crisis) which can be life-threatening.

Bibliography

Addison, T. (1855). *On the constitutional and local effects of disease of the supra-renal capsules*. Samuel Highley. https://addisons.org.au/wp-content/uploads/2018/12/8-Disease-of-the-Supra-renal-Capsules.pdf *(Accessed November 23, 2024)*

Al-Khanaty, A., Wells, H., Santucci, R. A., & Kim, E. H. (2025). Adrenal anatomy and physiology. *Urologic Clinics of North America, 52*(2), 169–179. https://doi.org/10.1016/j.ucl.2025.01.001

AZ Quotes. (n.d.). *Thomas Addison quotes*. AZ Quotes. https://www.azquotes.com/author/49831-Thomas_Addison *(Accessed November 22, 2024)*

Byrnes, K. G., Walsh, D., Lewton-Brain, P., McDermott, K., & Coffey, J. C. (2019). Anatomy of the mesentery: Historical development and recent advances. *Seminars in Cell & Developmental Biology, 92*, 4–11. https://doi.org/10.1016/j.semcdb.2018.10.003

Hellesen, A., Bratland, E., & Husebye, E. S. (2018). Autoimmune Addison's disease – An update on pathogenesis. *Annales d'Endocrinologie, 79*(3), 157–163. https://doi.org/10.1016/j.ando.2018.03.008

Hiatt, J. R., & Hiatt, N. (1997). The conquest of Addison's disease. *The American Journal of Surgery, 174*(3), 280–283. https://www.americanjournalofsurgery.com/article/S0002-9610(97)00136-0/abstract *(Accessed November 20, 2024)*

Miller, W. L., & White, P. C. (2022). History of adrenal research: From ancient anatomy to contemporary molecular biology. *Endocrine Reviews, 44*(1), 70–116. https://doi.org/10.1210/endrev/bnac019

Napier, C., & Pearce, S. H. S. (2012). Autoimmune Addison's disease. *La Presse Médicale, 41*(12). https://doi.org/10.1016/j.lpm.2012.09.010

Papadakis, M., & Manios, A. (2016). Landmarks in the history of adrenal surgery. *Hormones, 15*(1), 136–141. https://doi.org/10.14310/horm.2002.1612

Roberts, S. (2023, April 6). Northumbrian greats: Thomas Addison. *The Northumbrian*, (April/May 2023), 14–17. *(Accessed November 13, 2024)*

Royal College of Physicians. (n.d.). Thomas Addison. *History*, *3*, 205. https://history.rcp.ac.uk/inspiring-physicians/thomas-addison *(Accessed November 13, 2024)*

Images

Figure 1: Courtesy of the Wellcome Collection, a website operated by Wellcome Trust, a global charitable foundation based in the United Kingdom on Wikimedia Commons under an Attribution 4.0 International Deed (https://creativecommons.org/licenses/by/4.0/).

Figure 2: Reproduction from Cessarius J. Tabulae anatomicae in Papadakis (2015). Venice: Deuchinus; 1627. In public domain.

Figure 3: Picture of Guy’s hospital. In public domain.

Figure 4: Taken from Addison, Thomas. On the constitutional and local effects of disease of the supra-renal capsules. 1855. In public domain.

Figure 5: Courtesy of the author.

Exploring Human Physiology
PhysiOdyssey · 2025 · Vol 1, No. 1, pp. 15-17
https://doi.org/10.36399/10pjq436

Letters Inherited

By Jessica McKendrick

She sits.
Motionless, allowing the tide of time to wash over her.
Antiseptic acrid and eye watering.
Sinuses burn as fingertips grasp hospice bedsheets.
Hair, aged silver birch, cascades across her tired eyes.
Memories buried so deep, never to be recovered.
Weathered and worn thin over knuckles, tissue dries tears.
The words ricochet. ‘*Alzheimer’s’* they say.

Alzheimer’s?
Some plague of age, a high price to pay for a lifetime well spent.
Such grief is this.
Mourning who is not truly lost but who is still living.
Mother turned stranger. Brain turned monster.

Senile plaques grow tendrils deep into the synapses of her brain.
Rooting far below ground level; down through the cortical layers of soil.
They grow and leech, drinking her brain dry.
Fibrous and folded origami, the roots grow deeper, spawning infestation, rotten plum.
But there’s a damp that’s creeping in.
Trickling. Seeping. Lifting the wallpaper. Its edges curling.
There in the corner, where occipital lobe meets cerebellum.
As paper peels, putrid citrus sprays, neurones slither and tangles twist.

‘Alzheimer’s’
The words ricochet to the vestibule.
The echo chamber for her thoughts, her fears.
How terrifying is the mind when it becomes a stranger? An infestation, one’s own creation,
the repercussion of age.

‘Alzheimer’s?’ she hears.
A crescendo, applause from the audience?
In a panic she rises to her feet, but posture seizes.
Standing ovation!
Spine, frozen icicle as bone grinds together to a halt.
Each individual groove of her spine, overgrown in the garden of cartilage, a wild wisteria taking her home as its own.
Stems strengthen and calcify between vertebrae, as cartilage wears away and pain sears deep, weaving between the balustrade.
She is trapped. A prisoner in her own home.

Her hand reaches out; her cold fingertips finding solace in the warmth of my palm.
Arthritic knuckles melting into her own flesh and blood.

As her hand sits patiently in mine her eyes close for night.
I fear for the letters she is passing down to me, and from me to my own daughter.
Origami concealed plague of age
An envelope filled with malign destiny cast crimson in the light.
An envelope embossed with wax sealing my malignant fate.

Scientific Statement

Letters inherited is a creative piece exploring the neurodegeneration associated with Alzheimer’s disease. As the most common form of dementia, Alzheimer’s is broadly characterised by progressive memory loss, cognitive decline, and behavioural changes. Its pathological features are protein ‘plaques’ and ‘neurofibrillary tangles’ that accumulate around and within cells of the brain, ‘neurons’. Plaques and tangles disrupt transmission of signals between neurones, trigger neuroinflammation and ultimately lead to neuronal death. The piece draws parallels to the insidious spread of plaques and tangles in the brain of affected patients which lead to the described symptoms of memory loss. Additional reference to ‘calcified stems’ and ‘arthritic knuckles’ refers to the degeneration of bone associated with arthritis and osteoporosis, both frequent comorbidities in elderly patients with Alzheimer’s. Hereditary imagery invokes the genetic undercurrents recognised in these disorders and alludes to the intergenerational concern of inherited susceptibility.

Bibliography

Akin, O., Mironov, S., Pandit-Taskar, N., & Hann, L. E. (2007). Imaging of uterine cancer. *Radiologic Clinics of North America, 45*(1), 167–182. https://doi.org/10.1016/j.rcl.2006.10.009

Bendor, J. T., Logan, T. P., & Edwards, R. H. (2013). The function of α-synuclein. *Neuron, 79*(6), 1044–1066. https://doi.org/10.1016/j.neuron.2013.09.004

Gilman, C. P. (2016). *The yellow wallpaper*. Wisehouse Classics.

Gómez-Benito, M., Granado, N., García-Sanz, P., Michel, A., Dumoulin, M., & Moratalla, R. (2020). Modeling Parkinson's disease with the alpha-synuclein protein. *Frontiers in Pharmacology, 11*, Article 356. https://doi.org/10.3389/fphar.2020.00356

Johns Hopkins Medicine. (2023). *Spinal arthritis (arthritis in the back or neck).* https://www.hopkinsmedicine.org/health/conditions-and-diseases/spinal-arthritis

NHS. (2018, December 14). *Overview – Arthritis.* https://www.nhs.uk/conditions/arthritis/

NHS. (2019, June 18). *Osteoporosis.* https://www.nhs.uk/conditions/osteoporosis/

Exploring Human Physiology

PhysiOdyssey · 2025 · Vol 1, No. 1, pp. 18-21
https://doi.org/10.36399/q4t3h420

The Pulse of Emotion

By Amy O'Sullivan

How is it that a familiar face, soft eyes and a tight, pitiful smile can alter my very physiology? The machinery of my body, jolted by the shadow of someone I used to know. How is it that forming my own smile — one that can't quite reach the corners of my eyes, a polite, rehearsed mask — can make me acutely aware of the rhythmic beat in my chest? Can transform a heart that had been content with its steady rhythm to one forcing a pulsing, insistent throb.

The emotional centre of my brain, the amygdala, recognises the whispering of old memories, dormant emotions reawakened, this interaction, as an emotional stress. Recognises the emotional significance of a lingering look. And in protest to my own desire to maintain a composed front, to deny any and all emotion, activates my fight or flight response. My sympathetic response. I am a puppet under the control of my own body's unconscious responses.

I'm in a train carriage too crowded, too narrow, with a heartbeat that feels too loud, too fast. The screech of wheels on tracks and the rumble of engines are drowned out by the thundering rhythm of my own heart. My body has begun to transform this emotion into action, in preparation for an imagined threat. With every beat it demands attention, demands action.

The unseen conductor of my autonomic nervous system has blown his whistle. Chemicals epinephrine and norepinephrine, the messengers of this system, flood into my bloodstream and race along sympathetic nerves toward my heart. They travel like a harbinger, delivering a declaration of war.

The concealed mechanics of emotion, hidden, denied, but felt in full. Norepinephrine and epinephrine find friendship in the pacemaker of the heart, the sinoatrial node, binding to the cells' receptors and unleashing a cascade of changes. There is an influx of calcium in the cells of the sinoatrial node and elsewhere in the heart, akin to waves crashing on the shore. As calcium levels rise, the firing of electrical impulses controlled by the pacemaker surges like bullets from the barrel of a gun. My heart squeezes with increasing urgency and force.

I know this is what is supposed to happen, how my body has been programmed by history. That more blood is flowing from my heart to prepare to defend. That the body does not listen to logic or reason.

And just when I feel my heart can't bear it anymore — that it might make an escape attempt — the figure leaves my sight. Relief follows slowly but emotion lingers in my sweaty palms and rabbiting heart rate. I suppose I can refute my feelings to others, but my heart knows me the best, doesn't and can't lie. Neither of us can escape each other. A creeping shame overwhelms me from my involuntary reaction, a reminder that I'm not fully in control.

But I remember emotion isn't only in extremes: the heart bends to the will of joy, excitement and anticipation just the same. Your heart experiences your emotions with you, the stress of an upcoming exam, the thrill of a rollercoaster and the surprise of a younger sister hiding around a corner hoping to scare you. It ticks peacefully in my chest when I giggle along to stories told by an old friend. And my heart has not always beat against my will, it meets my demands for energy when I race along a track. Keeps me alive, keeps me safe.

To calm my beating heart, I take slow and deep breaths. Externally, it's the only thing one might note as peculiar: girl sitting steady as deep breaths pull oxygen into her lungs, lips parted to allow the passing of a whisper of air. A deliberate pause. Then, the hiss as breath is forced from my lungs as a warm gust. Each breath is a plead for calm.

My heart listens to my steady breaths and responds in kind. The vagus nerve heeds the call, a slow tug on the reins of the autonomic nervous system. Helping to restore balance between its parasympathetic and sympathetic systems. It runs through my body, like a series of wires reaching into various organs. It sends acetylcholine to the heart as a messenger to make it harder for electrical signals to fire from pacemaker cells, slowing the beat of the heart. The storm within the body fizzles out and with it, I return to reality. The heart relents to the control of the parasympathetic system, a small battle won in an everlasting push and pull.

The symphony of sound returns, I hear a muffled announcement over speakers as my five-minute train ride comes to an end. No permanent scar is left on my consciousness or heart, though for a short time, I am still aware of my heart beating in my chest. I am struck by its resilience to this constant change, a part of me I often take for granted.

My heart beats on — a strong, steady rhythm that continues, unbroken.

Scientific Statement

The Pulse of Emotion is a creative nonfiction piece that explores the body's physiological response to emotion, delving into a moment of heightened emotion/stress. The narrative explores how these intense emotions can activate the body's autonomic nervous system (the segment of our nervous system dedicated to involuntary bodily functions). Scientists understand that the autonomic nervous system mediates the body's response to emotional stimuli (think 'fight or flight'). The amygdala, a small crucial brain structure, processes sensory input (such as smell, visual, taste, and touch), integrates this information with emotional memories, and, if the stimuli are flagged as emotionally significant, can trigger a physiological response. These responses are driven by chemical messengers referred to as adrenaline (epinephrine) and noradrenaline (norepinephrine), which act on the heart's sinoatrial (SA) node to increase heart rate and contractile force by enhancing calcium influx and firing rate of the pacemaker cells.

Additionally, *The Pulse of Emotion* discusses the opposing effects of other emotions and emotional regulation techniques on our physiology. The parasympathetic system (commonly referred to as 'rest and digest' system) counteracts the sympathetic system primarily by releasing another chemical messenger, acetylcholine, via the vagus nerve. Acetylcholine slows the heart rate by inhibiting the same pacemaker cells of the SA node.

Ultimately, this piece highlights the intricate relationships between the internal systems that govern our physiological states, and explores how emotional triggers, both voluntary and involuntary, can provoke profound changes in our physiological state, revealing the balance and detail of these systems.

Bibliography

Azevedo, M., Martinho, R., Oliveira, A., Correia-de-Sá, P., & Moreira-Rodrigues, M. (2024). Molecular pathways underlying sympathetic autonomic overshooting leading to fear and traumatic memories: Looking for alternative therapeutic options for post-traumatic stress disorder. *Frontiers in Molecular Neuroscience*. https://doi.org/10.3389/fnmol.2023.1332348

Jami. (2022). *The science of stress*. Retrieved from https://jamiuk.org/stress-2-2/

Shaffer, F., McCraty, R., & Zerr, C. L. (2014). A healthy heart is not a metronome: An integrative review of the heart's anatomy and heart rate variability. *Frontiers in Psychology, 5*, Article 1040. https://doi.org/10.3389/fpsyg.2014.01040

Torpy, J. M., Burke, A. E., & Glass, R. M. (2001). Acute emotional stress and the heart. *JAMA, 286*(3), 360. https://doi.org/10.1001/jama.286.3.374

Wu, Y., Gu, R., Yang, Q., & Luo, Y. (2019). How do amusement, anger and fear influence heart rate and heart rate variability? *Frontiers in Neuroscience, 13*, Article 1131. https://doi.org/10.3389/fnins.2019.01131

Exploring Human Physiology

PhysiOdyssey · 2025 · Vol 1, No. 1, pp. 22-28
https://doi.org/10.36399/6bnazk06

Laudatio Turiae

By Julia Ann Calabrese

It seemed that our misfortunes would never end. Even I, with all of the suffering I had endured and overcome, could not see a path forwards for myself and my beloved husband. How I lamented that after his death, or mine, either of us should be left childless, like an unfinished inscription.

In all my wifely duties I had transcended expectations, my courage and bravery befitting of a man! Oh, the stories I could tell of when I faced abuse and cruelty against the criminals responsible for the deaths of my mother and father, when I stood up to Marcus Lepidus when he ignored Cesar's orders to reinstate my beloved husband…

Perhaps the gods, with their all-seeing eyes, could not allow a woman such as myself to bear children. Who do I blame for this — Venus?

By day, I was a dutiful wife, I took care of my husband, we kept each other company in our loving union, I oversaw our blessedly peaceful household. By night I was a shadow. I took to the streets in my cloak, I knocked on doors, scratched on them like an animal until the candlelight spilled over me like sweet nectar.

"Please, I must speak to the physician!"

Perhaps it was the pleading rosiness of my cheeks, the tearful wide eyes, or my sickly thin hands, but the servant always stepped aside. I pursued the physicians like a general at war, at war with an incurable sickness!

The answers were always the same. My blood was 'weak'.

"But how can my blood be poor? I bleed so thickly and achingly, and do you see the rosiness of my complexion? Oh physician, what should I do?"

"You can drink wine — this will increase your blood. You should also make offerings to Venus."

By morning I returned to my darling husband, exhaustion paling my face.

"My dear, you look unwell!" he would say, cupping my face.

"I am a little tired, that is all."

I bid him goodbye that morning, for he had business in the forum. I spent the remainder of the day reading the medical texts we kept in the household, sipping bitter wine, but none offered any insight into my condition.

“Here is a possibility, now, do not take offence at what I am going to say, for it is purely founded on my medical knowledge and Lucretius’s writing. There may be an incompatibility between yourself and your husband, and you might consider re-marriage as the best course of action.”

After all that we had been through! But if it was the only way to ensure his family line did not end, to produce young, healthy citizens…

When I wandered through the streets on my morning errands, my heart was cold. I stared at the baker’s wife, plump with child, as she wrapped the warm brown loaf. What hardships had she endured? Had she needed to protect her husband from the turbulence and violence of politics? Had she brought murderers to justice? Prostrated before Marcus Lepidus and been dragged away like a slave? Why was she, an average woman, blessed with fertility where I was empty, sick-blooded, and incompatible with my beloved?

Perhaps I was not a woman, but something else… a mistake. Or I had been too brave, too stubborn, too manly, and the gods saw fit to steal my womanhood from me.

“From my examination, I believe the cause of your inability to bear children is the size of your womb. It is too small, there is not enough room, I believe, for the seed to mix with your blood.”

“Is there anything I can do to fix this?”

“You must increase its size… I will recommend a compound to be drunk once a day, and correction of the womb’s opening. This will involve using an instrument, but it is not too painful, and has demonstrated hopeful results from other patients.”

One morning, my husband approached me, “My dear, you do seem better now. Your complexion is much healthier, and I am glad.”

“I have… I have been receiving treatment,” I told him. He looked surprised. Was I ill? Yes, I was ill, there was something wrong with my body, and I told him so. “We have been trying for a child for years, and if I have been acting different recently, it is because I was heavy with sorrow about my inability to bear children. But I have hope now.” I clasped his soft hands. “I have seen many good physicians and have been carefully following their instructions. I hope that soon I will finally bear you a child!”

My husband embraced me joyfully.

“You never cease to surpass all expectations of yourself,” he said, “My darling wife, I hope what the physician recommended is right and we can indeed have children together.”

My husband is a good man — I would not have fought so hard to protect him, sold my jewellery, provided slaves and food to him in hiding, were he not and if I did not love him dearly.

“Is it possible that your transition to womanhood was interrupted by these awful events you have mentioned? This might increase the difficulty of childbearing, but perhaps it will not be impossible if you keep a healthy lifestyle to promote fertility. Make sure you bathe frequently and eat the foods I listed. I’m afraid there is nothing more I can suggest.”

“But there must be!” I took the list in my weak hands, the corner scrunching. “Is there nothing more I can do? I have been trying to help my condition for a year to no avail…”

“It may be difficult, but perhaps speak with the Greek physician, Asclepiades. His medicine is Greek, but I hear good things about his practice.”

My hopes rested heavily on the Greek physician. I set out early with my husband in our cart, my cloak wrapped around my sunken shoulders, jewellery concealed in its folds. The journey was not long, but it felt like a day trundling through the streets of Rome, to a serene villa on the outskirts of the great city. Here, in the fresh countryside air, was where Asclepiades’s practice was situated.

Boldly, I strode up to the entrance, only to be met immediately by a young servant boy. He addressed me by my husband’s name.

“Do wait outside just a moment, please,” the servant boy asked us. He gestured to a slab for us to sit on. “The physician is finishing with his previous patient. He won’t be long.”

My husband and I sat, silent at first, until I spoke.

“I don’t know what I shall do if there is nothing more to try,” I said. The pleasantly sweet, warm countryside air and swishing grass beneath me soothed my mind. In the vast view, the city of Rome, the hills, the forests, I could finally grasp everything that I had been through to get here, all in the size of my fist.

“Do not fret, my darling. If nothing comes of this, then nothing more we shall do,” he said. “I could not have asked for a more loving wife, and if you are to be my only family until I die, so you shall be.”

At that moment, I might have burst into tears of sorrow. But I didn't, because the servant boy called to us to say that the physician was ready to see me. I was let inside the grand white villa. Its beautiful paintings of the human body and medicinal herbs breathed life into the walls and the green air of the countryside cleaned out any stagnant feeling in the rooms, any bitter sickness.

I met Asclepiades in the garden, surrounded by neatly trimmed bushes and a little pool of water. He stood from his stone slab to greet me, grey tunic cascading like a waterfall with every movement.

"Do sit," he said, gesturing to the adjacent slab. "And tell me what ails you." His accent was Greek, and he had a kind, elegantly bearded face.

"Oh Asclepiades, I have tried and tried everything the physicians in Rome have told me to try —," I grasped his hand and sat before him "— but I am unable to bear children for my husband. I will have to divorce him even though I love him dearly!"

"Don't be silly, woman," he said. "If you love your husband, do not divorce him. If you have tried everything in Rome, I suspect you have been told your blood is weak, you have drunk red wine, made offerings to Venus, been told that you are incompatible with your husband, and that your womb is too small, misplaced, or misshapen!"

"Yes, that is what I have been told."

"And I suppose that the cures were unpleasant! And that the more pleasant ones involved concoctions of herbs and such things to promote fertility."

"That's right."

"Well, I will tell you that, if you have tried all that, and nothing has worked, then there is nothing wrong with your womb that can be cured by a physician."

"Then… I must make more offerings to Venus!"

"You might, however, I think it best if you follow this regimen. Exercise regularly, but not too vigorously — just enough to keep the body in harmony, eat healthy foods and don't drink too much wine, I also recommend the occasional massage and some relaxing music. Perhaps one day you will bear a child, perhaps not. What I am telling you to do is to stop worrying about it, because all the little particles in your body will be swirling around so fretfully and anxiously and you will do your health no benefit!"

I was silent for a moment, and my shoulders rose with a heavy sigh.

"I understand. Thank you, Asclepiades, I know what I must do now."

My husband and I journeyed home. We arrived in the afternoon, and the servants had prepared our evening meal. After we had eaten, I took him aside.

"My dear husband," I began. "I know that you are waiting to hear what Asclepiades told me, so here it is. There is nothing more that can be done, and this is my situation. I must stop worrying about bearing children or my health may suffer. So, I have a solution. We shall be divorced, and I will choose a good woman for you who is certain to have a fertile womb, then we shall all live together, and I shall treat both of you as my family and love your children as if they were my own."

My husband had opened his mouth throughout my speech, as though the interjection was on the tip of his tongue. When I was finished, he closed it, and looked at me for some time.

"My beloved wife," he then said, "that is the most unacceptable thing I have ever heard! I love you and we shall not be divorced. It is too bad that we cannot have children, but I don't want you to worry about it any longer, as the physician Asclepiades said. Additionally… perhaps the issue is mine!"

I gasped when he said that, as though a coin had just dropped from the sky! How shocking it was to think that could have been the reason all along.

Truthfully, we can never be sure why I could not have children with my husband. We lived happily together for many years, and it was wonderful even without children, and I did not worry about it even slightly. If I ever looked forlorn, my husband quickly cheered me up with a story or a compliment, and all was well again.

Scientific Statement

This piece is based on the Laudatio Turiae, a tombstone inscription from a husband to his wife in classical Rome, dated to around 10 B.C.E - 1 B.C.E. Although much of it has been lost, it is amongst the longest surviving Latin inscriptions (Horsfall, 1983) and praises the *pietas* (duty/devotion) of an unknown woman, initially presumed by scholars to be Turia (identified by her husband, thought to be Q. Lucretius Vespillo). Turia's role in protecting her husband during a period of political unrest and bringing charges against her parents' murderers is highly abnormal for a Roman woman, however, the text stresses that Turia's traditional virtues were not undermined by her dalliance into heroism, portraying this as her true virtue. Horsfall (1983) also notes, significantly, how anti-Augustan the Laudatio Turiae is. Like many dictators, Augustus was concerned with fertility; he wanted lots of new Roman citizens and put laws in place to financially disadvantage those who did not produce children. These contradictions are only some of the many reasons this inscription still fascinates scholars to this day.

In terms of the advice Turia receives to ‘cure’ her infertility, there is historical evidence to suggest that all of these methods were used around the first century B.C.E. in Ancient Rome, and I have tried to be as accurate as possible in incorporating these into my work. Causes of infertility could range from an incompatibility of the partners (re-marriage was recommended by the philosopher Lucretius [see Fleeming, 2021]) to misalignment of the uterus (as discussed by Flemming [2013]; these ideas are from the Hippocratic Corpus, a collection of Greek medical texts which cover the ‘diseases of women’). Male infertility was therefore not inconceivable, but methods of treatment focus on female infertility, suggesting that she was often believed to be responsible for childlessness. Some methods of treatment include purification by fumes or chemicals and use of a ‘probe’ to fix the opening of the womb; Flemming (2013) includes a list of methods recommended by the ancient text *On Infertile Women*, part of the *Hippocratic Corpus*. Asclepiades was a Greek physician who practiced medicine in Rome. He is probably so well thought of in modern times because of his relatively non-invasive approach to medicine, challenging the Hippocratic idea of the four humours. According to Hippocrates, illness was caused by an imbalance blood, phlegm, yellow bile and black bile. Originating in the fifth century B.C.E., this idea was not properly disproven until the 1800s. Asclepiades recommended diet, exercise and relaxation (bathing, music) to promote health. He was also very particular about when herbal remedies should be prescribed and believed illness was caused by issues with small particles that passed through the body. It is possible that his medicine had a therapeutic effect; in modern times we are aware of the negative health impacts of stress and anxiety on the body, although research into a possible relationship between stress and fertility is ongoing (Rooney and Domar, 2018).

Bibliography

Being Roman with Mary Beard. (n.d.). Episode 2: *The vengeance of Turia* [Audio podcast episode]. In *Being Roman with Mary Beard*. BBC Sounds. Retrieved July 8, 2025, from https://www.bbc.co.uk/programmes/m001sctb

Brady, F. A., & Kelly, B. D. (2023). Asclepiades of Bithynia: Greek physician and medical reformer. *Irish Journal of Medical Science, 192*(4), 1775–1778. https://doi.org/10.1007/s11845-022-03216-2

Flemming, R. (2013). The invention of infertility in the classical Greek world: Medicine, divinity, and gender. *Bulletin of the History of Medicine, 87*(4), 565–590. https://doi.org/10.1353/bhm.2013.0064

Flemming, R. (2021). Fertility control in ancient Rome. *Women's History Review, 30*(6), 896–914. https://doi.org/10.1080/09612025.2020.1833491

Horsfall, N. (1983). Some problems in the Laudatio Turiae. *Bulletin of the Institute of Classical Studies*(30), 85–98.

Laudatio Turiae: The English translation of the inscription used. (n.d.). Retrieved July 8, 2025, from https://droitromain.univ-grenoble-alpes.fr/Anglica/Laudatio_Turiae_Wistrand.htm

Lucretius. (1924). *On the nature of things* (W. H. D. Rouse, Trans.; M. F. Smith, Rev.; Loeb Classical Library No. 181). Harvard University Press. (Original work published ca. 50 BCE)

Rooney, K. L., & Domar, A. D. (2018). The relationship between stress and infertility. *Dialogues in Clinical Neuroscience, 20*(1), 41–47. https://doi.org/10.31887/DCNS.2018.20.1/klrooney

PhysiOdyssey
Exploring Human Physiology
PhysiOdyssey · 2025 · Vol 1, No. 1, pp. 29-32
https://doi.org/10.36399/c6x48406

Emergency Department Cubicle 2b

By Laura Webb

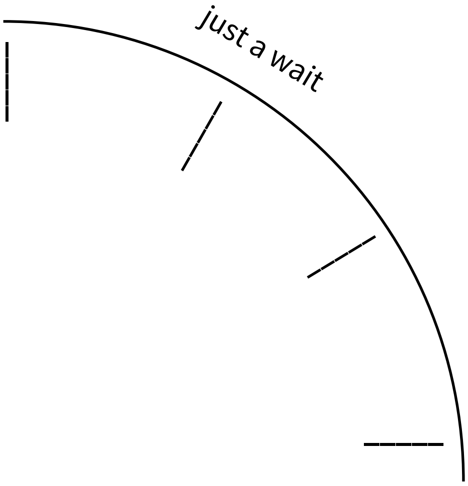
07:35 **19 ♀**

just a lump
just a few lumps

just a bit of lost weight

just a blood test

just a scan



10:40 **72 ♂**

F

U C K

K N O W S

D O C T O R

14:10 **19 ♀**

the Big C
Cry
Cure
Calm
Can’t

Cause

Clinics

Chemo

Cut hair

Call Mum

17:05 **36 ♀**

if it
has no
heartbeat
my tears will
fill a stony font
I shall baptise
my grief

18:10 **54 ♂**

the heart------*is weak*------their words------reverb------around-----

----my head---------tonight---------it’s hard---------to sleep-----------

it’s hard------------to breathe------------I hear------------alarms-------

-------a crowd--------------appears--------------long words--------------

the bed-------------and all--------------my thoughts--------------go flat

----------long words----------------white sky----------------cold mask---

------------------------bed moves---

---red sign----------------------

20:45 **36 ♀**

its
fruitpip
heartbeat
small enough
to easily fit into
my single tear
of relief

Scientific Statement

Presented as pseudo-case notes, the poem tells the stories of several patients who occupy the same Emergency Department cubicle throughout a day. I explore their emotional experiences using poetic forms rooted in physiology. Sources of inspiration range from visible symptoms (blood drop/teardrop) to diagnostic tests (Snellen chart, heart monitor) and pathological processes (the cloning and mutation of cancer cells).

The Emergency Department seemed the perfect setting for the idea because it is a liminal, transient space which never sleeps, always in a state of flux – like the human body itself.

Exploring Human Physiology
PhysiOdyssey · 2025 · Vol 1, No. 1, pp. 33-37
https://doi.org/10.36399/rx5y1c42

The Thymus Elite Training Program: Journey of a Naïve T cell

By Hannah Eadie

Ever since I was a young, untested blood stem cell, I dreamt of one thing: to become one of them — the elite warriors of the immune system. They weren't common red blood cells that carry oxygen, nor were they the platelets that patch up wounds. They were trained assassins who could spot invaders like viruses and cancer cells, and coordinate deadly attacks with ruthless precision. Their unique badges shone in the light, commanding respect from all. I knew I had to find a way to join their ranks and become one of the mighty T cells.

My journey began in the protected environment of the bone marrow, where all blood cells are born. Like my fellow stem cells, I was unaware of the challenges ahead. Looking back now, that naïve stem cell I once was is a distant memory. On differentiation day, when I chose the lymphoid classification, it was final; I would join the infection-fighting path. And so, I began my journey, carried by the currents of the bloodstream, drawn by an unexplainable force that led me to the thymus, a hidden training ground nestled behind the breastbone. This was no ordinary program, but a brutal academy where only 2% of recruits survive the most rigorous training imaginable.

By the time I reached the thymus, I was surrounded by thousands of rookies, all just like me. *Thymocytes*, the untested, the unproven. We wore no badges, had no rank, and the weight of that absence was heavy on my membrane. Around us stood cortical veterans, stern and silent, their eyes never leaving us. Their faces were unreadable, their expression a mixture of authority and quiet understanding. They had been through the trials themselves. They knew what was at stake.

We were marched straight to the first challenge in the cortex. No introductions. No comfort. There are no bunks here, no time for rest. The veterans have no patience for weakness —only results.

Suddenly, my thoughts were interrupted as chemicals flooded the air sending what felt like tiny electric shocks through my body. Metal straps shot out of the walls, securing my head and arms, and pinning me in place.

“Initiate the transformation!” commanded one of the veteran cells. I watched as an instructor approached a computer, typing quickly. Squinting, I caught a glimpse of the code:

beta chain s,s,sel — then a sharp pain seared through my body shattering me like a piece of glass, no broken fragment the same. I watched as the shards of my being started to rise and move like an orchestrated ballet, following a dormant blueprint, putting each piece back together.

Around me, fellow recruits convulsed violently in their restraints as their cells underwent the radical change, some unable to handle such a drastic rebuild. The glint in their eyes faded away as they dissolved into the thymus walls.

Above us, the veteran cells watched with cold detachment. They've seen countless recruits either succeed or fail. Another wave of pain crashed through me, but I gritted my teeth as my pieces finally reassembled. Slowly, I felt my broken fragments lock in place. I gasped for air, from the sense of relief, the restraints releasing. But when I looked at my hands, expecting to see marks from the restraints, I was horrified to find that my once bare limbs were now covered with new, powerful receptors. The veterans moved among us, their expressions unreadable.

"Attention!" The command rang through the academy, echoing in my mind like a distant drumbeat. “You've reached Positive Selection Trials. Use your new receptors to find your target. Survival of the fittest is the law — adapt or perish.”

My membrane trembled with the force of their signal, the weight of their instructions sinking deep into my nucleus. The transformation was far from over. I could feel the new receptors embedded in my skin — like tiny, foreign eyes, sharp and aware, scanning the air for the presence of a signal I didn't yet understand. The air was thick with an unfamiliar energy, a pulse just beyond my reach.

I focussed, trying to tune into the flood of new sensations, but it was overwhelming. Signals poured in from every direction, raw and unfiltered, bombarding me from every angle. My receptors were supposed to help me navigate this alien environment and help me make sense of the world around me, but it was all so unfamiliar. The sights, the smells, the very textures of this new world—they were all jumbled together in an incomprehensible swirl. I couldn't tell what to focus on, where to direct my attention, and what was important.

I felt my receptors flicker, a soft blue glow. Someone — or something — was approaching. I hesitated. The aura they emitted was different, but not hostile. My receptors registered warmth, an absence of threat. It wasn't the sharp, aggressive nature of an invader. This presence was calm, familiar, and friendly. Another worker of the body, a member of the system, just like me. I politely offered my hand to shake, connecting my receptors with theirs in a gentle embrace.

“Pass, progress recruit,” stated a veteran. Was it that easy?

I made my way to the final assessment in the medulla and watched in horror as a recruit attacked a worker, causing the veterans to step in and kill the erratic recruit. I looked down at the receptors that saved me in the last challenge; they no longer felt so alien. The chaos that once overwhelmed me was now something I could begin to navigate, and for the first time, I sensed the faintest flicker of control.

The veterans in the medulla stood like stern judges, covering what looked like a simulator.

“You have shown you can identify friend from foe; however, can you do this when the pressure is high, and time is limited?” barked a Medulla veteran.

We stood in formation, tense, watching as each of us was called up to face this ultimate challenge. The medullary environment hummed with anticipation—an eerie silence filled only by the distant hiss of the simulator powering up. Each of us knew what was at stake: the difference between survival and obliteration. Only those who can master the art of self-tolerance, who can distinguish the body's own cells from foreign invaders under the most intense of conditions, would pass.

The first recruit nervously approached the simulator. A piercing noise filled the medulla as it powered up, surrounding the recruit with images from all angles. At the sight of a liver cell, the recruit panicked and their receptors showed red, indicating a foreign threat. The consequences of the mistake were instant, turning the recruit into debris.

Another trainee approached, a pancreatic cell flashing this time. I witnessed the opposite problem — their receptors glowed a faint blue, flickering with uncertainty and lack of self-assurance. This is also fatal.

My turn arrived. The simulator dazzled like a disco ball, flashing before me in rapid succession an array of proteins from the brain, heart, skin, and more. Each one a potential trap, a test of my ability to maintain composure.

The pressure was overwhelming. I heard the hum of the machine’s power and felt the weight of the medullary atmosphere pressing around me. The first image flickered in front of me: a thyroid protein. I recognised it immediately — self, familiar, harmless. Stay calm, I reminded myself again. My receptors activated, glowing a steady, controlled blue. It's a sign of proper recognition. I’d passed the first test. One down, but dozens more to come.

The simulator continued, each protein flashing before me like a target at a shooting range. The rapid-fire pace of the simulation didn't leave me time to think — it's all about reflexes, instincts homed in our genetics. But, unlike traditional combat training, where success means eliminating a threat, success here means showing restraint. Restraint and precision would keep me alive and prevent me from turning against the body I am sworn to protect.

The next antigen flashed — a protein from the heart. I recognised it, and again, my receptors fired in steady blue, a signal of tolerance. The next one was from the skin. No hesitation. Blue light, stable. One after another, the antigens flashed before me — brain proteins, gut cells, and others. It was all a blur of self and potential danger. But each time, I remained calm. I did not falter. I did not mistake self for foe.

After what seemed like hours, I heard the soft click of the simulator powering down, and the room settled. The pressure lifted, but the weight of the experience remained. I had done it. The medullary veterans stood in solemn silence. One of them nodded in approval. The others remained impassive, their eyes giving nothing away. The test was over, but the true challenge had only just begun. I would leave this place, not just as a T cell trained for battle, but as a force that understands the true value of restraint in a world of threats.

Scientific Statement

The Thymus Elite Training Programme describes the process of T cell differentiation and maturation, key elements of the adaptive immune system. T cells are a type of white blood cell known as lymphocytes, which play a central role in identifying and responding to pathogens. The narrative begins with their origin in the bone marrow as haematopoietic stem cells, unspecialised precursors capable of developing into various blood cell types. From there, T cell precursors migrate to the thymus, where they undergo a stringent developmental programme to become functional and self-tolerant immune cells.

This maturation involves two key processes: positive selection and negative selection. Positive selection occurs in the thymic cortex, where immature T cells are tested for their ability to recognise and bind to self-MHC (major histocompatibility complex) molecules. Those that fail to recognise MHC undergo programmed cell death. This step is essential because T cells must be able to interact with MHC, which presents foreign antigens to them during an immune response.

Negative selection, which occurs in the thymic medulla, tests the developing T cells against a range of self-antigens derived from different tissues. T cells that bind too strongly to these self-antigens are eliminated to prevent autoimmunity. Together, these processes ensure that only T cells capable of recognising antigens in the context of MHC but not reacting strongly to the body's own tissues are allowed to mature and enter the circulation.

Bibliography

Cleveland Clinic. (2023). *T cells: Types and function*. https://my.clevelandclinic.org/health/body/24630-t-cells

GeeksforGeeks. (2022). *Major histocompatibility complex – Structure, types, & functions*. https://www.geeksforgeeks.org/major-histocompatibility-complex/

Hwang, J.-R., Byeon, Y., Kim, D., & Park, S.-G. (2020). Recent insights of T cell receptor-mediated signaling pathways for T cell activation and development. *Experimental & Molecular Medicine, 52*(5), 750–761. https://doi.org/10.1038/s12276-020-0435-8

Janeway, C. A., Travers, P., Walport, M., & Shlomchik, M. J. (2015). *Generation of lymphocytes in bone marrow and thymus*. In *Immunobiology: The immune system in health and disease* (5th ed.). Garland Science. https://www.ncbi.nlm.nih.gov/books/NBK27123/

Shah, D. K. (2022). *T-cell development in thymus*. British Society for Immunology. https://www.immunology.org/public-information/bitesized-immunology/immune-development/t-cell-development-thymus