published in Reader's Digest,
22 May 2020

link to Reader's Digest article [1]

hormones [2]



Human beings are social animals; we just love to communicate—especially via text message, with 15.2 million messages sent every minute worldwide. But did you know that your body has its very own version of text messaging, in the form of hormones? Both are essential short messaging services.

Origins

In 1905, Professor Ernest Starling first used the word “hormone” in a lecture at the Royal College of Physicians in London to describe the chemical messages that travel tirelessly throughout your body. The word derives from Greek, meaning “to arouse” or “excite”, since hormones can do both at the cellular level.

Text messages, in comparison, were not used until 1992, when a “Merry Christmas [3]” message was sent via the Vodafone network.

Sending messages

In text-talk, “commands” include HAND (have a nice day), MYOB (mind your own business), WAM (wait a minute) whilst FYI (for your information) and ICYMI (in case you missed it) can prompt the recipient into action.

Hormones also communicate commands and post prompts, travelling not via radio waves but within the circulation. Their short messages include that of the hormone oxytocin (telling the pregnant womb to contract for delivery), insulin [4] (asking for cells to take in glucose and use it for energy) and testosterone [5] (triggering increases in muscle mass and strength). Leptin [6] tells our brain that we feel full after a meal, helping us avoid overeating.

Just as text messages can be sent to a single recipient or many, so hormones can act on a particular organ or more diffusely. Thyroid hormone, for example, is said to “fan the fires of life”, controlling the rate at which our

billions of cells burn food into energy, finding us a fine balance between feeling sluggish and lethargic or jittery and on edge.

Receiving messages

Text messages can be received silently, through surreptitious glances at your phone, in contexts where a call would be inappropriate or impolite. For the most part, it's as though our bodies have a "do not disturb" or "silent" setting, with hormones able to carry on their chemical conversations without us even being alerted. We are, for example, oblivious to the effects of growth hormone [7] in the body, as it works to boost protein production, promote the use of fat, interfere with the action of insulin, and raise blood sugar levels.

We are though much more aware when adrenaline messages different parts of the body during a time of stress, causing the heart to race, breathing to quicken and muscles to tense.

Whether a particular cell or organ "receives" the hormone message depends not on it having a specific 11-digit number, as in the case of text messaging, but instead on it having specifically shaped proteins, called receptors, on its surface, or deep within, that perfectly match the shape of the hormone—as a glove to a hand or a lock to a key. Each body cell will respond to only a few of the hormones present in the circulation. Dr Frederic Martini describes how the other hormones are treated like "junk mail" and ignored, because the cell lacks the receptors to read the messages they contain.

Deleting the message

Messages sent via Snapchat are usually only available for a short time before they become inaccessible to their recipients. After a single viewing, the video disappears by default, with the focus being on "the ephemeral nature of fleeting encounters [8]".

Many hormones in circulation remain functional for less than one hour, and sometimes for as little as two minutes. They are inactivated when they bind to their target tissues, or when they are absorbed and broken down by the liver or kidneys.

Thyroid hormone—and a few others—are the exception, lingering for much longer (more than a week) through being bound to special transport proteins for protection. Essential for increasing oxygen consumption, growth and development, it's good news that supplies of thyroid hormone are kept topped up.

Predictive texting

In predictive texting, the mobile phone suggests and completes words for you even as you're midway through typing.

There's an element of prediction, or anticipation, in hormone messaging too with, for example, the female sex hormones oestrogen and progesterone acting in the pregnant woman to increase breast volume and growth of her milk-duct system as they "predict" and prepare for the birth of the breastmilk-hungry baby.

Even thinking about exercise, meanwhile, increases our heart rate by a few beats per minute, allowing the muscles to increase production of energy before we actually need it. Adrenaline is the hormone doing the predicting here, released during a phenomenon called the "anticipatory rise".

Gastrin [9] is a hormone produced in the stomach. Prompted by the sight, smell and taste of food, it predicts the arrival of food during a meal, triggering the release of stomach acid to aid digestion.

Making mistakes

David Cameron famously, and mistakenly, signed off his text messages with a “LOL”, thinking it stood for “lots of love” instead of “laugh out loud”. It’s also confusing whether “FYI” stands for “for your eyes only” or “for your information”.

Disorders, or mistakes, in hormone messaging happen when a gland makes too much or too little hormone, perhaps because of a tumour or because the body’s immune system attacks the gland. Diabetes, hyperthyroidism and short stature in children can all result.

In *I Am Joe’s Body* [10], a *Reader’s Digest* book published in 1975, the author describes what happens when too much of the hormone aldosterone (made by the adrenal glands, on top of the kidneys) is made. “Vital potassium would be lost in urine, and excess salt retained”, he writes. “Joe’s muscles would weaken and possibly become paralysed. His heart would race, his blood pressure soar, his fingers tingle; headache would be continuous.”

Just as texting can go awry when you are stressed, drunk, anxious or in pain, hormone levels are similarly sensitive, with adrenaline surging in response to pain, excitement, anxiety, cold and haemorrhage. Alcohol, meanwhile, can suppress the secretion of a brain hormone called ADH [11]—which usually functions to reduce urine output. And that’s why alcohol makes you pee.

Nature got there first

In his book on nature [12], Dr Phil Gates describes how birds conquered the air long before the Wright brothers and how bats and dolphins have their own form of sonar. When it comes to text messaging, it seems that nature again got there first, in the form of your heroic hormones.

MEDICAL JOURNALISTS' ASSOCIATION

Source URL:https://www.helencowan.co.uk/heres-what-your-hormones-are-trying-tell-you

Links
[1] https://www.readersdigest.co.uk/health/wellbeing/heres-what-your-hormones-are-trying-to-tell-you [2] https://www.helencowan.co.uk/../tags/hormones [3] https://www.npr.org/2017/12/04/568393428/the-first-text-messages-celebrates-25-years [4] https://www.readersdigest.co.uk/health/health-conditions/all-you-need-to-know-about-insulin [5] https://www.readersdigest.co.uk/health/health-conditions/7-things-you-didnt-know-about-testosterone [6] https://www.health.harvard.edu/blog/why-eating-slowly-may-help-you-feel-full-faster-20101019605 [7] https://www.health.harvard.edu/diseases-and-conditions/growth-hormone-athletic-performance-and-aging [8] https://en.wikipedia.org/wiki/Snapchat [9] https://www.sciencedirect.com/topics/medicine-and-dentistry/cephalic-phase [10] https://www.amazon.co.uk/Am-Joes-Body-J-Ratcliff/dp/042507689X [11] https://www.healthline.com/health/adh [12] https://books.google.co.uk/books/about/Nature_Got_There_First.html?id=Zx0th8kkdDAC&redir_esc=y