

Special Issue: Advanced Themes in Endocrinology

## Editorial

## TEM at 30: Advancing Topics in Endocrinology

M. Beymer<sup>1</sup>

The idea that our blood and other bodily fluids contain some factor or factors which influence our body systems has been a long-standing one. From as early as 200 BC in China, people have been investigating hormones in some fashion or another [1]. Often, they knew that certain ‘humors’ (typically some bodily fluid) had properties that could be isolated in specific ways. However, it was not until the 19th and 20th centuries that the field of endocrinology as we know it started to take form. With the work of Berthold in the mid-1800s and the identification and isolation of secretin and adrenaline at the beginning of the 20th century, endocrinology in the modern age was born [2,3]. A little over 100 years later, our overall understanding of the basis of endocrine systems and interactions has become a solid foundation in biological research. As we answer many of the basic questions in endocrinology, we are presented with more complex and interdisciplinary questions, much like many current research areas in the life sciences.

This special issue, to help commemorate 30 years of *Trends in Endocrinology and Metabolism*, focuses on a few fascinating and unique topics in endocrinology. Since the inaugural issue of TEM in the fall of 1989, our basic understanding of the field has greatly advanced and the articles in this issue are meant to illuminate some of the interesting avenues that current endocrinology research is taking. Several articles within even discuss hormones that had yet to be described and characterized, namely leptin, kisspeptin, and ghrelin. This, I believe, exemplifies not only the great strides general science has made in the past three decades but also how far we have truly come in our understanding of hormones and their functions within the body, although there is of course much farther to go.

To start this collection off, Kim and Iremonger discuss effects of feedback and ‘timing’ on the circuitry and regulation of the stress axis at the level of the central nervous system, helping to highlight the continued nuances found in well-established endocrine systems [4]. Next, Kikusui *et al.* discuss interesting consequences of domestication on the endocrine systems in dog. They focus on the roles of the oxytocin and glucocorticoid systems in human domestication of canines, even going into how alterations in these have affected the evolution of canine–canine and canine–human behavioral interactions [5].

Further discussions on the stress axis continue with Bartlett, Lapp, and Hunter focusing on molecular genetic and epigenetic regulation on cellular function and how this can shape the response to environmental stimuli [6]. Additionally, Friedman-Einat and Seroussi discuss recent studies elucidating the role of leptin in Aves and how these differ and, in some cases, conflict with its currently established role as an adipostat in mammalian species [7]. This discussion highlights the continued need to investigate endocrine systems in new, unique models and to illuminate that mammals are not the only available models.

Sliwowska *et al.* elaborate on interesting findings on the role of kisspeptin, a neuropeptide well-known as a key regulator of the reproductive axis, in peripheral and central metabolism, with possible links to a role in sex-specific responses to type 2 diabetes (T2D) [8]. Davies *et al.* discuss and illuminate how the ‘gut hormone’ ghrelin likely has roles in neurogenesis and memory through its effects on hippocampal cells and function, thus highlighting possible avenues and links between nutritional status and cognitive functions [9].

Finally, Vilardaga and colleagues discuss how understanding the structure of the parathyroid hormone (PTH) receptor (PTHr) and how it binds PTH and PTH-related peptides has helped to better elucidate how PTHr functions in bone physiology and calcium homeostasis [10].

<sup>1</sup>Editor, Trends in Endocrinology and Metabolism

\*Correspondence: [mbeymer@cell.com](mailto:mbeymer@cell.com)



Together, the articles in this special issue highlight some of the evolving understanding surrounding endocrine systems and how they interact together along with other bodily systems. For example, both kisspeptin and ghrelin have well-established roles in reproduction and satiety/nutritional status, respectively; however, we are coming to understand that they also have important functions in metabolism and cognition. These highlight a seemingly recurring theme in endocrinology, where emerging work illuminates the multifunctional aspects of some of our favorite hormones. I hope you will enjoy these insightful articles and that they will be useful to your own research. Of course, there are many topics in endocrinology that we are unable to cover in one single special issue, but I look forward to entertaining suggestions for additional reviews on this topic in this coming anniversary year. We also plan to highlight some further important topics with special series and special focus issues.

I would like to close by offering a sincere thank you to our authors for contributing high-quality authoritative articles, our reviewers for their insightful feedback and suggestions, the TEM Editorial Advisory Board for continuing to provide TEM with important and timely topics, and to you, the readers, for your continued interest and support. As always, I love to hear from our readers and I welcome comments or feedback you might have by e-mail at [tem@cell.com](mailto:tem@cell.com) or via Twitter to [@Trends\\_Endo\\_Met](https://twitter.com/Trends_Endo_Met).

## References

1. Kumar, A.A. Kumar *et al.* (2018) Endocrine system. In *Encyclopedia of Animal Cognition and Behavior*, J. VonK. Vonk and T. ShackelfordT. Shackelford, eds. (Springer)
2. Wabitsch, M.M. Wabitsch (2017) Gastrointestinal hormones induced the birth of endocrinology. *Endocr. Dev.* 32, 1–7
3. Rao, Y.Y. Rao (2019) The first hormone: adrenaline. *Trends Endocrinol. Metab.* 30, 331–334
4. Kim, J.J. Kim and Iremonger K.K. Iremonger (2019) Temporally tuned corticosteroid feedback regulation of the stress axis. *Trends Endocrinol. Metab.* 30
5. Kikusui, T.T. Kikusui *et al.* (2019) Endocrine regulations in human-dog coexistence through domestication. *Trends Endocrinol. Metab.* 30
6. Bartlett, A.A. Bartlett *et al.* (2019) Epigenetic mechanisms of the glucocorticoid receptor. *Trends Endocrinol. Metab.* 30
7. Friedman-Einat, M.M. Friedman-Einat *et al.* (2019) Avian leptin: bird's eye view of evolution of vertebrate energy-balance control. *Trends Endocrinol. Metab.* 30
8. Dudek, M.M. Dudek *et al.* (2019) Diabetes type 2 and kisspeptin: central and peripheral sex-specific action. *Trends Endocrinol. Metab.* 30
9. Buntwal, L.L. Buntwal *et al.* (2019) Ghrelin mediated hippocampal neurogenesis – implications for health and disease. *Trends Endocrinol. Metab.* 30
10. Sutkeviciute, I.I. Sutkeviciute *et al.* (2019) PTH/PTHrP receptor signaling, allostery, and structures. *Trends Endocrinol. Metab.* 30