Pituitary adenylate cyclase activating polypeptide (PACAP) was discovered in 1989 in the US-Japan Biomedical Research Laboratories of Tulane University, led by Akira Arimura. Atsuro Miyata and Akira Arimura isolated two peptides from ovine hypothalami, with 38 and 27 amino acid residues that could stimulate adenylate cyclase in pituitary cells, resulting in the name of the peptide (Miyata et al. Biochem Biophys Res Commun 1989). In the last 25 years since its discovery, research has proved that PACAP has a very widespread occurrence. Its receptors, the specific PAC1 receptor and the receptors also binding VIP (VPAC1 and 2 receptors), also have widespread distribution in various tissues. The distribution, the splice variants of the receptors, and the diverse signaling explain the miscellaneous actions of the neuropeptide. PACAP belongs to the vasoactive intestinal peptide/secretin/glucagon peptide family and is implicated in a large array of physiological and also pathological processes. Several review articles published in the last 10 years provide excellent sources for reviews on occurrence, as well as the different effects and therapeutic relations of PACAP (the most comprehensive review so far is seen in Vaudry et al. Pharmacol Rev 2009). The present book is a collection of reviews from leading PACAP research investigators from all around the world.

PACAP is one of the most well-conserved peptides throughout evolution, indicating important roles in basic biological processes. The first section of this volume contains reviews on evolutionary aspects of the peptide—from molecular evolution to different roles in annelids and molluscs. Soon after its discovery, it became evident that PACAP plays a role in neuronal cell proliferation, differentiation, and migration. Thanks to the vast amount of data in this area, PACAP is now considered a trophic factor. Reviews on these developmental aspects of the peptide will comprise the next section. The following section is focused on the theme of receptors and signaling, with overviews of novel directions in peptide transport and pharmacological properties. The sections following these contain reviews on the physiological functions in various organs and systems, starting with effects in the endocrine system, thermoregulation, circadian rhythm, and cardiac excitability. Afterwards, there are discussions about actions in the gastrointestinal and urinary tracts, normal and pathological bone and cartilage development, and roles in the reproductive
系统。PACAP 已经被证明也扮演多种生理屏障的角色，尤其是通过血脑屏障的运输 PACAP 已经得到很好的研究。PACAP 不仅直接影响神经功能，还展示了众多胶质细胞的影响，如在两篇进一步的综述中所描述的那样。一个单独的章节将讨论 PACAP 在感觉系统中的功能，如嗅觉、听觉和视觉系统，其中最后的一个部分将集中在 PACAP 对视网膜的保护作用。PACAP 最受研究的特性之一是其强大的神经保护作用，因此下一部分包含三个关于这两个神经系统中这些保护作用的综述。非常活跃的调查正在进行，以了解 PACAP 在疼痛状态中的作用，特别是偏头痛。一个部分是为这些综述提供一个关于 PACAP 的综述。作为 PACAP 部分共享受体的血管活性肠肽，一个与 PACAP 相关的肽，其炎症功能已知，从肽的发现后不久，关于 PACAP 在免疫系统中作用的数据收集就相对早期了。自第一份关于 PACAP 免疫功能的描述以来，已收集了大量的数据，这些数据被总结在下一个部分的三个综述中。另一个非常研究的领域是 PACAP 在心理过程和障碍中的作用，从抑郁到焦虑。一个由六篇综述组成的部分提供了一个对这些研究的综述。最后，有三篇综述描述了 PACAP 在与癌症、人奶和人血的关系中的临床方面，以及 PACAP 作为潜在的生物标志物的作用。

在本质上，这本书是一本详细且全面的参考资源，涵盖了这个有趣肽的作用，它具有多种效果并越来越多地考虑其治疗作用。

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