Felix Hoppe-Seyler (1825–1895) was a pioneer of biochemistry, remembered not only for his discovery of hemoglobin and his contributions to the chemical characterization of many other biological compounds and processes but also for having been the mentor of Friedrich Miescher and Albrecht Kossel. In his preface to the first issue of Zeitschrift für Physiologische Chemie, Felix Hoppe-Seyler coined the term Biochemistry (‘Biochemie’) for the then newly emerging discipline.
Epigenetic tumor stem cell reprogramming as a cancer driver. Shown on the cover is a representative hematoxylin-eosin (HE) stained section of a human-like B-cell lymphoma arising in mice where oncogene expression is restricted to the stem cell compartment. Tumor B-cells are present in the small intestine of these mice, infiltrating the lamina propria and the epithelium (main and bottom panel). These tumor cells have a B-cell identity, defined by Pax5 immunohistochemistry analysis (lower left panel), whereas the oncogene (MALT1) is not expressed in the cancer cells (upper panel). These findings introduce a new perspective on oncogenic transformation: certain oncogenes may act as 'passengers' to epigenetically reprogram tissue-specific stem/progenitor cell into a malignant cancer stem cell state. The epigenetic reprogramming by oncogenes appears to involve changes in DNA methylation and histone modifications illustrated in the three insets as examples of experimental results. This could provide an explanation for the failure of some modern targeted therapies to clear tumor stem cells, despite being effective against evolved tumor cells. As a consequence, targeted treatment strategies may need to be altered to accommodate combinations of agents that target oncogenic pathways that are active at both the early and late stages of tumor development. For further information see the article by Martín-Lorenzo et al. on pp. 1315–1320 in this issue.
Contents

Guest Editorial — 1263

HIGHLIGHT: NEW INSIGHTS IN EPIGENETICS

Boet van Riel and Frank Rosenbauer
Epigenetic control of hematopoiesis: the PU.1 chromatin connection — 1265

Melanie Weiss, Christoph Plass and Clarissa Gerhauser
Role of lncRNAs in prostate cancer development and progression — 1275

Julia Anna Kleinmanns and Daniel Schubert
Polycomb and Trithorax group protein-mediated control of stress responses in plants — 1291

Anne Zirkel and Argyris Papantonis
Transcription as a force partitioning the eukaryotic genome — 1301

Carola Ingrid Weidner and Wolfgang Wagner
The epigenetic tracks of aging — 1307

Alberto Martín-Lorenzo, Inés Gonzalez-Herrero, Guillermo Rodríguez-Hernández, Idoia García-Ramírez, Carolina Vicente-Dueñas and Isidro Sánchez-García
Early epigenetic cancer decisions — 1315

Reviews

Rolf Stricker and Georg Reiser
Functions of the neuron-specific protein ADAP1 (centaurin-α1) in neuronal differentiation and neurodegenerative diseases, with an overview of structural and biochemical properties of ADAP1 — 1321

Sebastian Kötter, Christian Andresen and Martina Krüger
Titin: central player of hypertrophic signaling and sarcomeric protein quality control — 1341

Research Articles/Short Communications

Protein Structure and Function

Ingrid L. Cockburn, Aileen Boshoff, Eva-Rachele Pesce and Gregory L. Blatch
Selective modulation of plasmodial Hsp70s by small molecules with antimalarial activity — 1353