

Chemistry

The Nobel Prize in Chemistry 2015 has been awarded jointly to Tomas Lindahl, Paul Modrich, and Aziz Sancar “for mechanistic studies of DNA repair”. This work has led to a detailed understanding of the fundamental repair pathways that allow DNA lesions to be corrected, namely base excision repair, mismatch repair, and nucleotide excision repair. This field was summarized some time ago in a Review in *Angewandte Chemie*.^[1] Lindahl identified the first DNA repair proteins and rationalized the base excision repair mechanism. The detection mechanisms of DNA repair proteins have been discussed very recently in a Minireview in *ChemBioChem*.^[2] Modrich initially demonstrated (in collaboration with Matthew S. Meselson) that mismatch repair could be directed by DNA methylation. Subsequent studies in bacteria and eukaryotic cells resulted in a detailed understanding of the mechanism. Sancar identified the proteins involved in nucleotide excision repair of UV-damaged DNA. He also investigated the mechanism of photolyases. The crystal structure and mechanism of a DNA (6-4) photolyase has been reported in *Angewandte Chemie*.^[3]

Tomas Lindahl (Francis Crick Institute, Hertfordshire) completed his PhD and MD at the Karolinska Institutet, Stockholm. He carried out postdoctoral research with Jacques Fresco at Princeton University and with Gerald Edelman at Rockefeller University, New York, and subsequently returned to the Karolinska Institutet. In 1978, he was made professor at the University of Gothenburg, and in 1981, he moved to the Imperial Cancer Research Fund (ICRF) Mill Hill Laboratories, London. In 1984, he was made Director of the Clare Hall Laboratories at the ICRF and Cancer Research UK (now part of the Francis Crick Institute), where he remained until 2009. He is currently emeritus group leader at the Francis Crick Institute.

Paul Modrich (Duke University and Howard Hughes Medical Institute, Durham, North Carolina) studied at the Massachusetts Institute of Technology, and completed his PhD at Stanford University in 1973. He joined the Duke Cancer Institute in 1976 and was made professor at Duke University in 1984.

Aziz Sancar (University of North Carolina at Chapel Hill) completed his MD at Istanbul University in 1969 and carried out his PhD (awarded in 1977) with C. Stanley Rupert at the University of

Texas at Dallas. After postdoctoral research at with W. Dean Rupp at Yale University (1977–1982), he joined the faculty at the University of North Carolina at Chapel Hill, where he is currently Sarah Graham Kenan Professor of Biochemistry and Biophysics.

Physiology or Medicine

The Nobel Prize in Physiology or Medicine 2015 has been awarded for the development of natural-product-based therapies for the treatment of parasitic diseases. **William C. Campbell** (Drew University, Madison) and **Satoshi Ōmura** (Kitasato University, Tokyo) were each awarded one-quarter of the prize for their discovery of avermectin, which acts against infections caused by roundworm parasites. **Youyou Tu** (China Academy of Traditional Chinese Medicine, Beijing) was awarded one-half of the prize for discovering the antimalarial active component artemisinin. Earlier this year, Ōmura reported in the *European Journal of Organic Chemistry* on the synthesis of α -hydroxyamides,^[4a] and in *Chemistry—A European Journal* on the asymmetric synthesis of indole alkaloids.^[4b]

Physics

The Nobel Prize in Physics has been awarded jointly to **Takaaki Kajita** (University of Tokyo) and **Arthur B. McDonald** (Queen's University, Kingston, Ontario) for establishing that neutrinos can change identities and therefore have mass, which contradicts the established Standard Model of particle physics.

- [1] O. D. Schärer, *Angew. Chem. Int. Ed.* **2003**, 42, 2946; *Angew. Chem.* **2003**, 115, 3052.
- [2] C.-G. Yang, K. Garcia, C. He, *ChemBioChem* **2014**, 10, 417
- [3] M. J. Maul, T. R. M. Barends, A. F. Glas, M. J. Cryle, T. Domratcheva, S. Schneider, I. Schlichting, T. Carell, *Angew. Chem. Int. Ed.* **2008**, 47, 10076; *Angew. Chem.* **2008**, 120, 10230.
- [4] a) T. Yamada, T. Hirose, S. Ōmura, T. Sunazuka, *Eur. J. Org. Chem.* **2015**, 296; b) T. Yamada, T. Ideguchi-Matsushita, T. Hirose, T. Shirahata, R. Hokari, A. Ishiyama, M. Iwatsuki, A. Sugawara, Y. Kobayashi, K. Otoguro, S. Ōmura, T. Sunazuka, *Chem. Eur. J.* **2015**, 21, 11855.

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