



## Albert Eschenmoser



**Date of Birth** 5 August 1925

**Place** Erstfeld (Switzerland)

**Nomination** 9 June 1986

**Field** Organic Chemistry

**Title** Emeritus Professor

**Most important awards, prizes and academies** *Awards:* Benoist Prize, Swiss Gov. (1973); Welch Award, R.A. Welch Foundation, Houston, TX (1974); Cope Award, Amer. Chem. Soc. (1984); Wolf Prize in Chemistry, Israel Gov. (1986); Paracelsus Prize, Swiss Chem. Soc. *Academies:* Akademie der Naturforscher Leopoldina, Halle, Germany; Pontifical Academy of Sciences; Academia Europaea; American Academy of Arts and Sciences, Boston, MA; National Academy of Sciences, Washington, DC; Royal Society, London; Akademie der Wissenschaften, Göttingen, Germany; Croatian Academy of Arts and Sciences. Ordre 'Pour le mérite', Berlin, Germany; Österreichisches Ehrenzeichen für Wissenschaft und Kunst, Wien, Austria.

**Summary of scientific research** A. Reaction mechanism and reaction stereochemistry: Early experimental and theoretical studies relevant to terpene biosynthesis on the course and stereochemistry of acid-catalyzed cyclizations of terpenoid polyenes (biogenetic isoprene rule, together with L. Ruzicka, 1953); the stereochemical interpretation of the biogenetic isoprene rule, together with D. Arigoni and L. Ruzicka (1955); the experimental demonstration of strain release control of the oxidation of alcohols with chromic acid (1955) and of stereoelectronic control of SN<sup>2</sup>- reactions (1970); experimental and theoretical studies on nitrogen inversion (1969). B. *Chemical synthesis:* development of new reactions and reagents: Introduction of heterocyclic fragmentation reactions into organic synthesis (1952); epoxy-ketone → alkinone-fragmentation (1967); amide acetal version of Claisen rearrangement (1969); methods for making C, C-bonds: enamino-iminoester condensations (1964), sulfide-contractions (1968), dimethyl-methylidene-iminium iodide (1971) and  $\alpha$ -Chloro-nitrone reactions (1972). C. *Chemical synthesis:* synthesis of complex natural products and related structures: Synthesis of the alkaloid of the autumn crocus, Colchicin (1959); synthetic routes to corrins (1964, 1969); synthesis of vitamin B<sub>12</sub> (collaboratively with R.B. Woodward) (1972); synthetic studies related to the problem of vitamin B<sub>12</sub> biosynthesis (1980). D. *Contemporary studies:* Chemical etiology of nucleic acid structure; experimental and theoretical studies relevant to the problem of designing chemical models of biogenesis.

**Main publications** Eschenmoser, A., *Zur säurekatalysierten Zyklisierung bei Mono- und Sesquiterpenverbindungen*, Promotionsarbeit Nr 2018, ETH Zürich 1951; Eschenmoser, A., Ruzicka, L., Jeger, O. and Arigoni, D., *Zur Kenntnis der Triterpene. Eine stereochemische Interpretation der biogenetischen Isopren regel bei den Triterpenen*, *Helv. Chim. Acta*, 38, p. 1890 (1955); Stadler, P.A., Nechvatal, A., Frey, A.J. and Eschenmoser, A., *Untersuchungen über den sterischen Verlauf säurekatalysierter Cyclisationen bei terpenoiden Polyenverbindungen*, *Helv. Chim. Acta*, 40, p. 1373 (1957); Schreiber, J., Leimgruber, W., Pesaro, M., Schudel, P., Threlfall, T. and Eschenmoser, A., *Synthese des Colchicins*, *Helv. Chim. Acta*, 44, p. 540 (1961); Bertele, E., Boos, H., Dunitz, J.D., Elsinger, F., Eschenmoser, A., Felner, I., Gribi, H.P., Gschwend, H., Meyer, E.F., Pesaro, M. and Scheffold, R., *Ein synthetischer Zugang zum Corrinssystem*, *Angew. Chem.*, 76, p. 393 (1964); Felix, D. and Eschenmoser, A., *Language Inversion am pyramidal gebundenen Stickstoff: Isolierung von diastereomeren 7-Chlor-7-azabicyclo (4.1.0) heptanen bei Raumtemperatur*, *Angew. Chem.*, 80, p. 197 (1968); Yamada, Y., Miljkovic, D., Wehrli, P., Golding, B., Löliger, P., Keese, R., Müller, K. and Eschenmoser, A., *Ein neuer synthetischer Zugang zum Corrinssystem*, *Angew. Chem.*, 81, p. 301 (1969); Tenud, L., Farooq, S., Seibl, J. and Eschenmoser, A., *Endocyclische SN- Reaktionen am gesättigten Kohlenstoff?*, *Helv. Chim. Acta*, 53, p. 2059 (1970); Eschenmoser, A., *Roads to Corrins (Centenary*

Lecture), *Quart. Revs.*, 24, p. 366 (1970); Eschenmoser, A., *Post-B12 Problems in Corrin Synthesis*, *Chem. Soc. Revs.*, 5, p. 377 (1976); Eschenmoser, A., Organische Naturstoffsynthese heute. Vitamin B12 als Beispiel, *Naturwiss*, 61, p. 513 (1974), erweiterte Version in Englisch: Eschenmoser, A. and Wintner, C.E., Natural Product Synthesis and Vitamin B12, *Science*, 196, p. 1410 (1977); Pfaltz, A., Juan, B., Fässler, A., Eschenmoser, A., Jaenchen, R., Gilles, H.H., Diekert, G. and Thauer, R.K., Zur Kenntnis des Faktors F430 aus methanogenen Bakterien: Struktur des porphinoïden Ligandsystems, *Helv. Chim. Acta*, 65, p. 828 (1982); Eschenmoser, A., Chemistry of Corphinoids, *Ann. N.Y. Acad. Sci.*, 471, p. 108 (1986); Eschenmoser, A., Vitamin B12: Experimente zur Frage nach dem Ursprung seiner molekularen Struktur, *Angew. Chem.*, 100, p. 5 (1988); Eschenmoser, A., Chemical Etiology of Nucleic Acid Structure, *Science*, 284, p. 2118 (1999).