

Research Program on Characterization, Conservation, Restoration and Sustainable Use of the Biodiversity of the State of São Paulo

“The Virtual Institute of Biodiversity”



Biota Fapesp Current Coordination Members



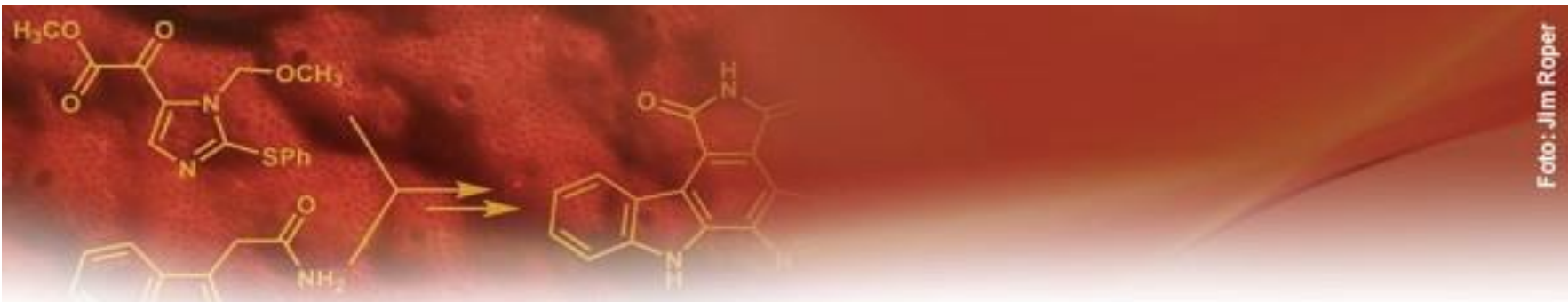


Foto: Jim Roper



Recent Advances on the Synthesis of Bioactive Natural Metabolites

Roberto Gomes de Souza Berlinck

Chemistry Institute, University of São Paulo, member of the BIOTA-FAPESP program and chair of the workshop

Vanderlan S. Bolzani

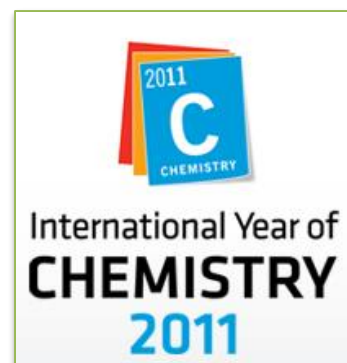
Chemistry Institute of São Paulo State University at Araraquara and member of the BIOTA-FAPESP Program

United Nations Educational, Scientific and Cultural Organization



BIODIVERSITY IS LIFE BIODIVERSITY IS OUR LIFE

- ❖ International Year of Biodiversity aimed at to safeguard this irreplaceable natural wealth and also to reduce biodiversity loss. This is vital for current and future human wellbeing.
- ❖ It is a unique opportunity to increase understanding of the vital role that biodiversity plays in sustaining life on Earth.



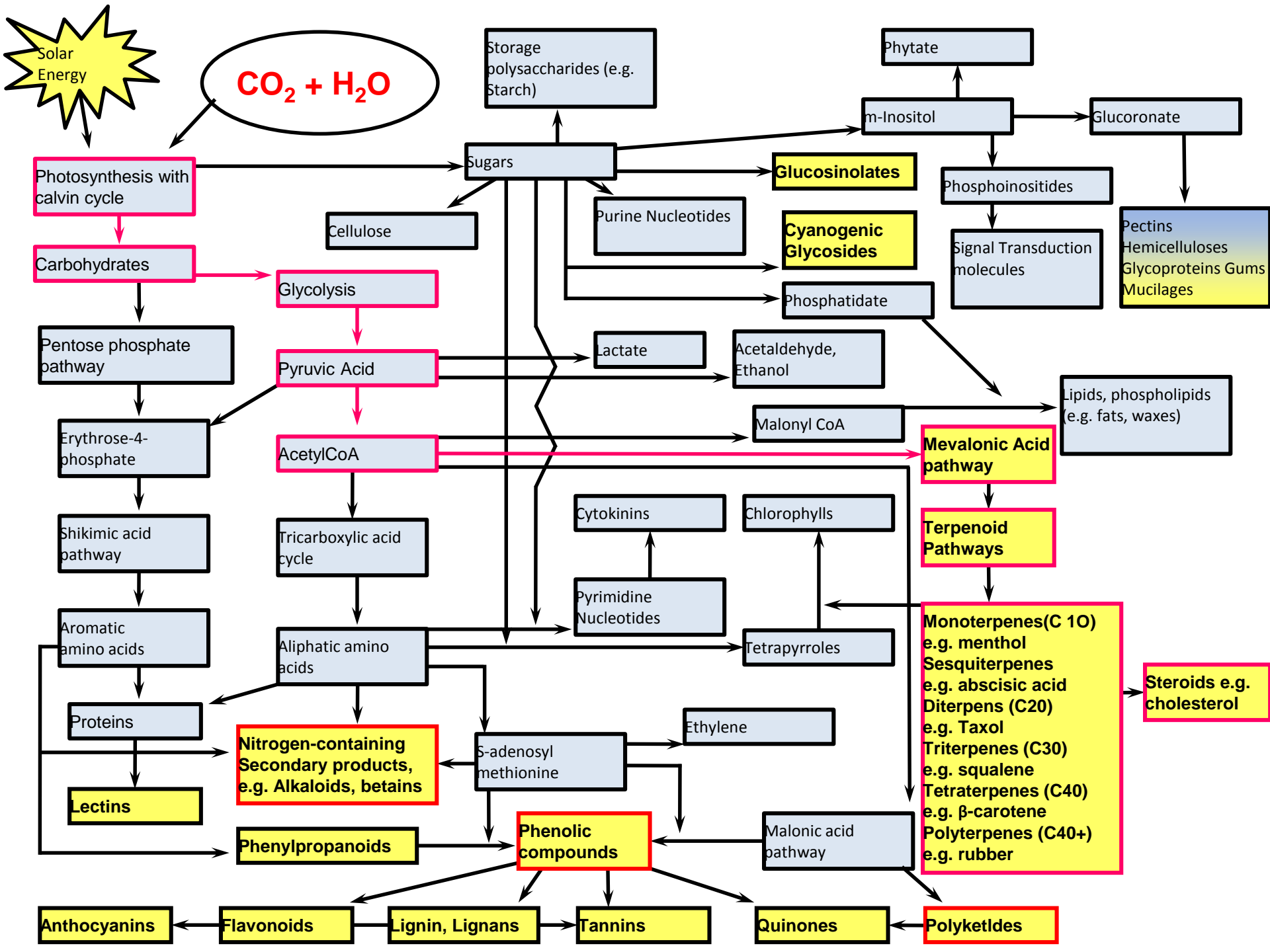
CHEMISTRY OUR LIFE OUR FUTURE

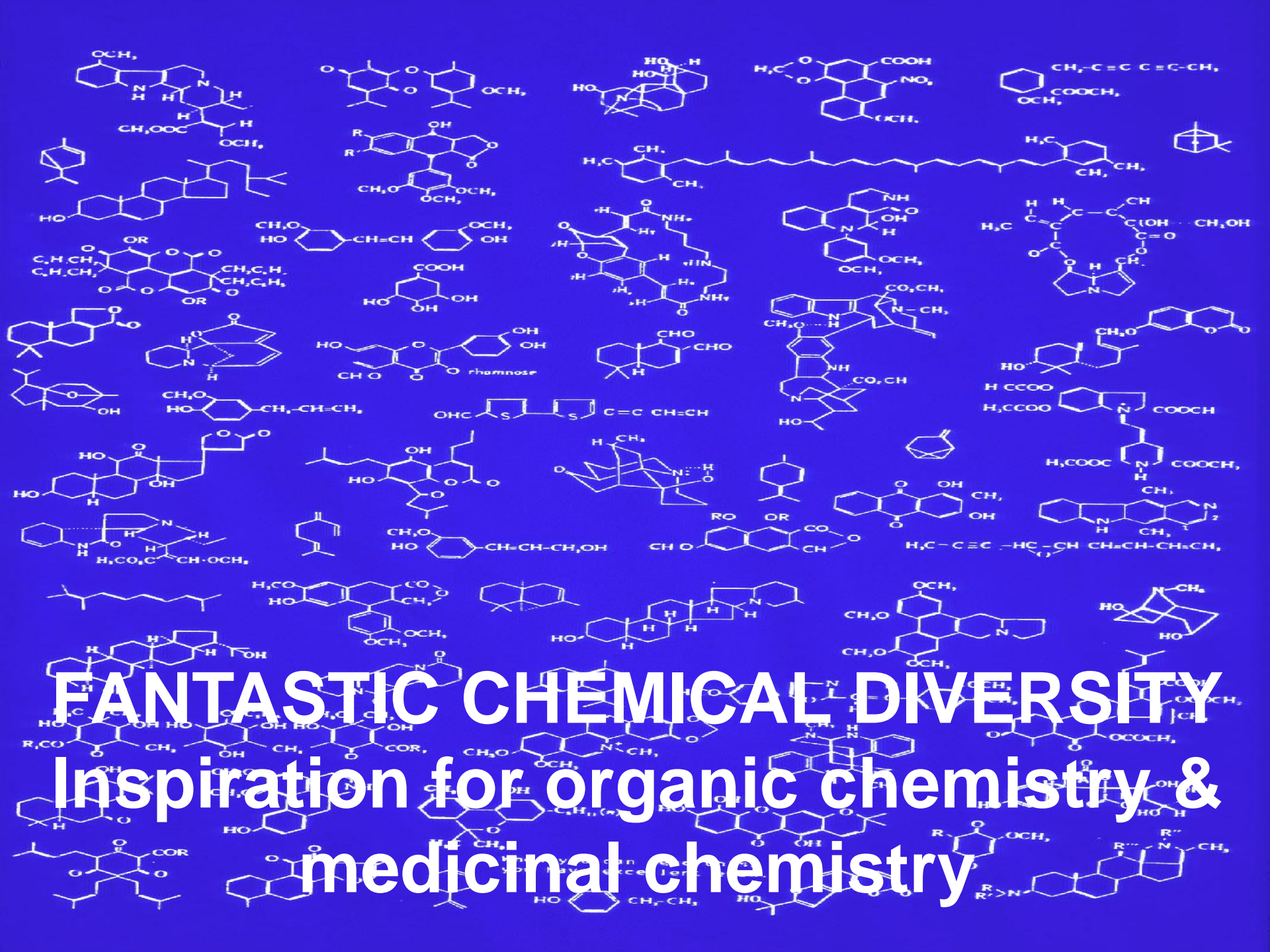
- ❖ To emphasize the importance of Chemistry for a sustainable world - *Chemistry our life our future*;
- ❖ Illustrate the role of Chemistry for global challenges (*energy, climate changes, and health*);
- ❖ Encourage interest of young generation for the creative future of chemistry;



LIGHT-BASED TECHNOLOGIES

- ❖ Photosynthesis - process that converts energy in sunlight to chemical energy used by green plants and other organisms, which begins when energy from light is absorbed by proteins called reaction centers that contain green chlorophyll pigments. A seemingly simple process, photosynthesis is actually quite complex and is the basis by which we grow all of our food and produce important resources for medicine and also fossil fuels.





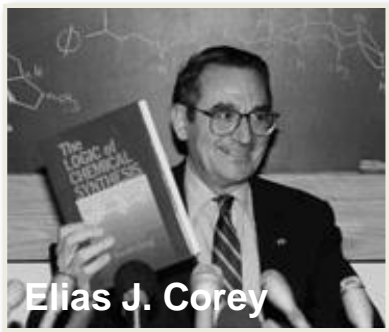
FANTASTIC CHEMICAL DIVERSITY
Inspiration for organic chemistry &
medicinal chemistry

Inspiration for science and particularly for Chemistry

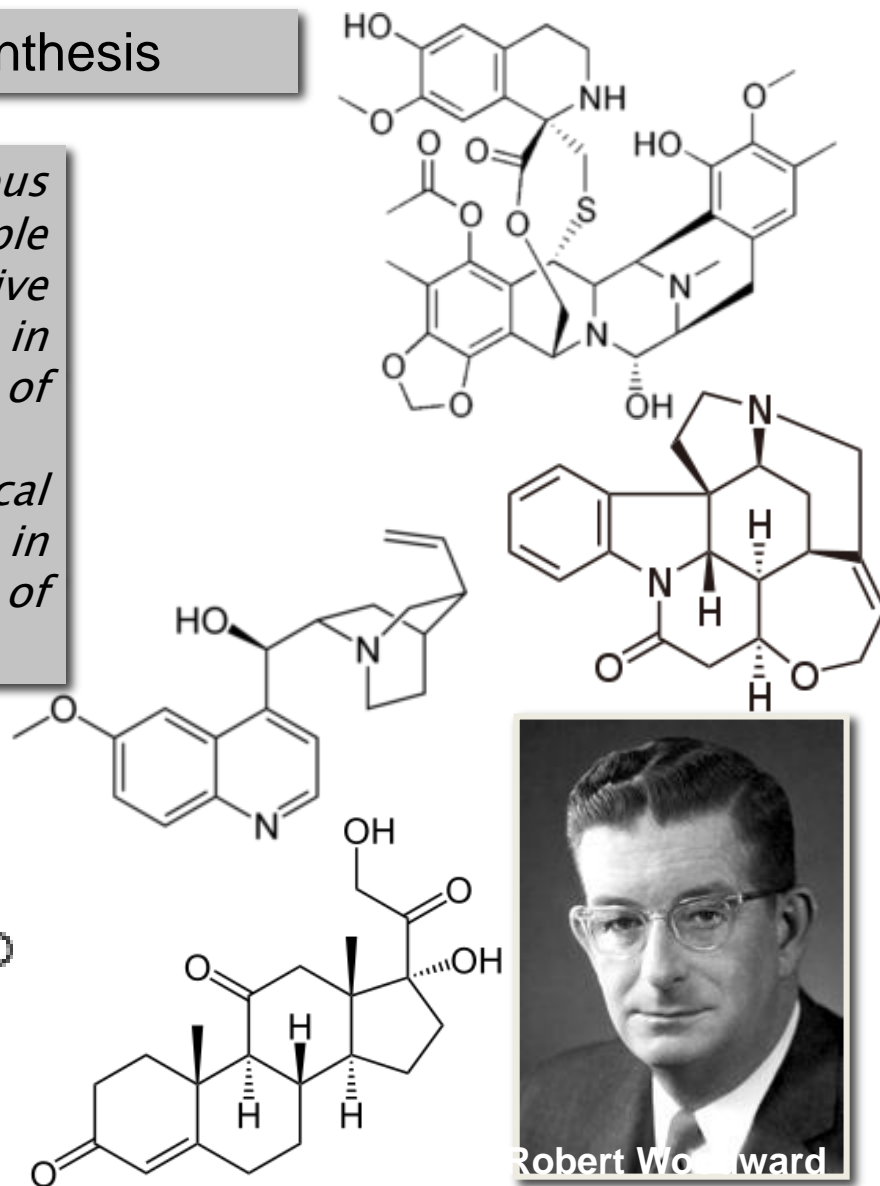
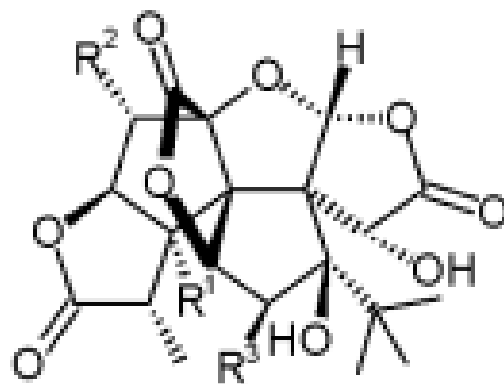
Great contribution to modern organic synthesis

“Nature continues to be exceedingly generous to the synthetic chemist in providing ample opportunity for discovery and creative endeavor of highest magnitude and in surround him with an incredible variety of fascinating and complicated structures.

I believe that Chemistry including chemical synthesis, will be the key drive of progress in medicine and human health during the rest of the 21st century” (E. J. Corey (Nobel Prize)



Elias J. Corey



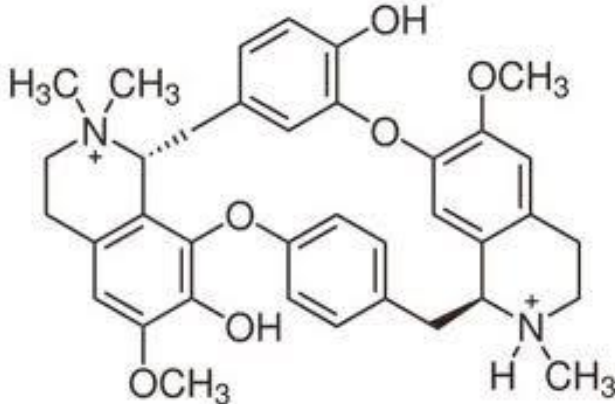
Robert Woodward

2 out of 50.000 plant species were selected for the preparation of curare

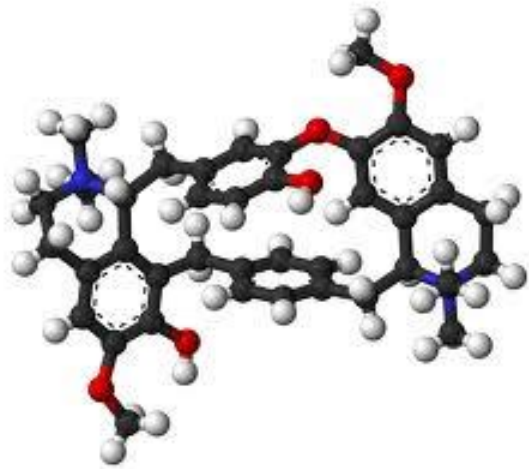


tubocurarine

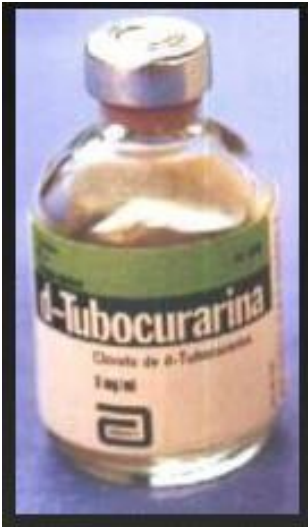
Chondrodendron tomentosum (Menispermaceae) - Curares



D-Tubocurarin



“Introduction of tubocurarine into anaesthetic practice, by Griffith and Johnson, in 1942, caused profound changes in the efficacy and safety of anaesthesiology”

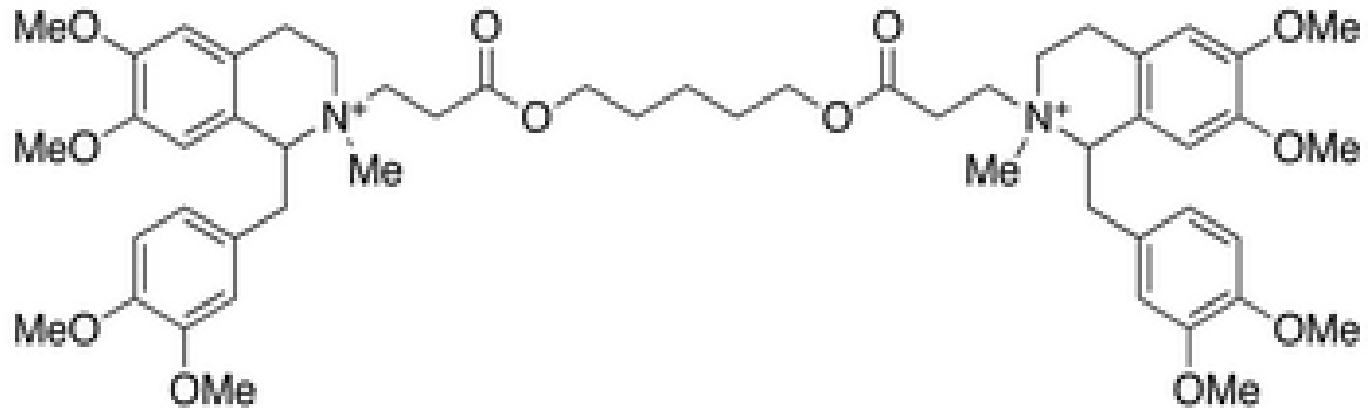


Traditionally known as curare – is a potential source of biologically benzylisoquinoline dimer alkaloids

Atracurium (Tracurium®) a synthetic derivative based in the structure of Tubocurarin



“The most fruitful basis for the discovery of a new drug is to start with an old drug model structurally focused on natural products” (Prof. James W. Black Nobel Price of medicine in 1988)



Traditional plant species used by Amazonian Indians, inspired the development of a class of anesthetic drugs

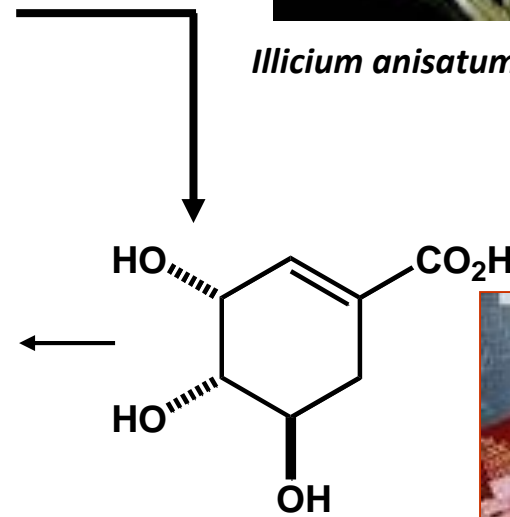
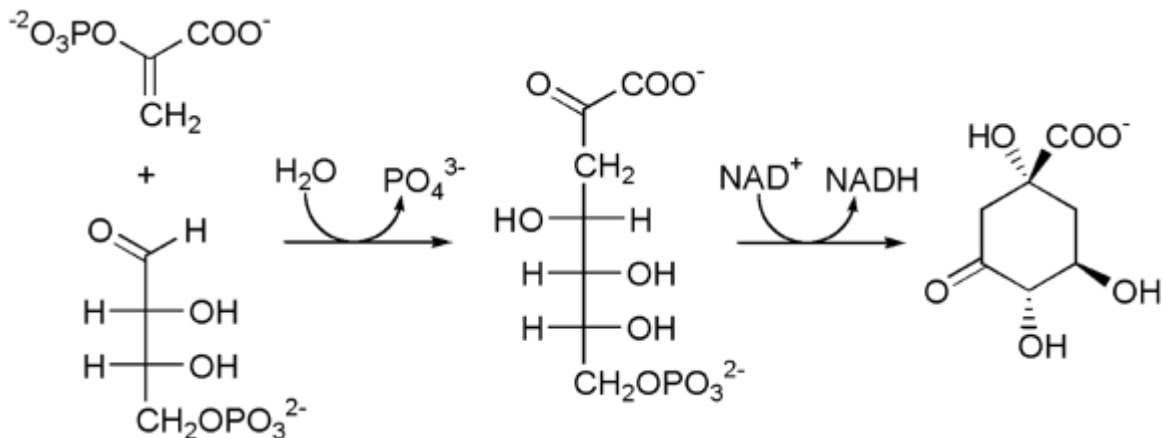
Curare and its successors. A 50-year's evolution. Buzello W, Diefenbach C. *Anesthesiol Intensivmed Notfallmed Schmerzther.* 1992, 27(5):29



Shikimic acid a intermediate key for biosynthesis of all phenolic derivatives accumulated in plants



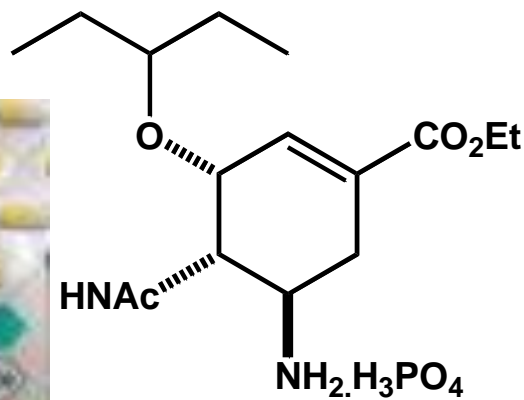
Illicium anisatum (star anise)



(-)-shikimic acid

Shikimic acid precursor for:

- Aromatic amino acids phenylalanine and tyrosine
- Indole, indole derivatives and tryptophan
- Alkaloids and phenolics
- Lignoids, lignins and tannins

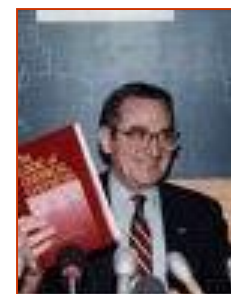


Tamiflu® (oseltamivir)

**Antiviral drug –
treatment and prophylaxis of influenza virus A and B**

It is a neuraminidase inhibitor

Higher doses and longer durations – treatment of H5N1-type influenza A



Nobel Prize in Physiology & Medicine Awarded to 3 Scientists for work on natural products, derivatives and Parasite-Fighting Therapies

