



From Plant to Drug

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Source Material

= Biomass

- Plants
- Microorganisms
 - bacteria, fungus
- Marine organisms
- Animal products

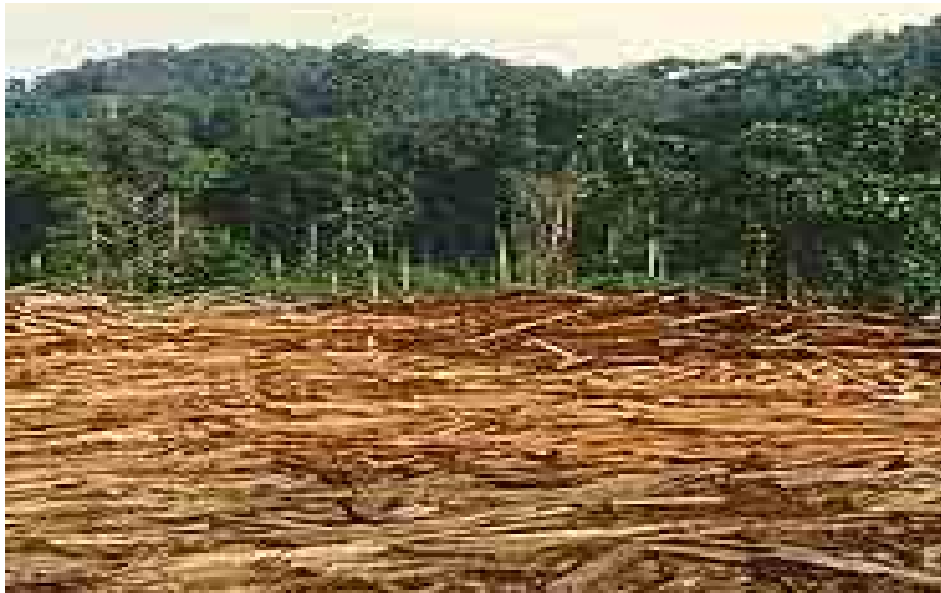


Role of Biodiversity in Medicine

- 1.75 million known species of animals, plants, fungi, & micro-organisms
- Estimated to be 10 million species on earth
- Each species contains 100's - 1,000's of chemicals
- 1 billion - 1 trillion chemicals

Loss of Biodiversity

- ~ 100 species/day is lost

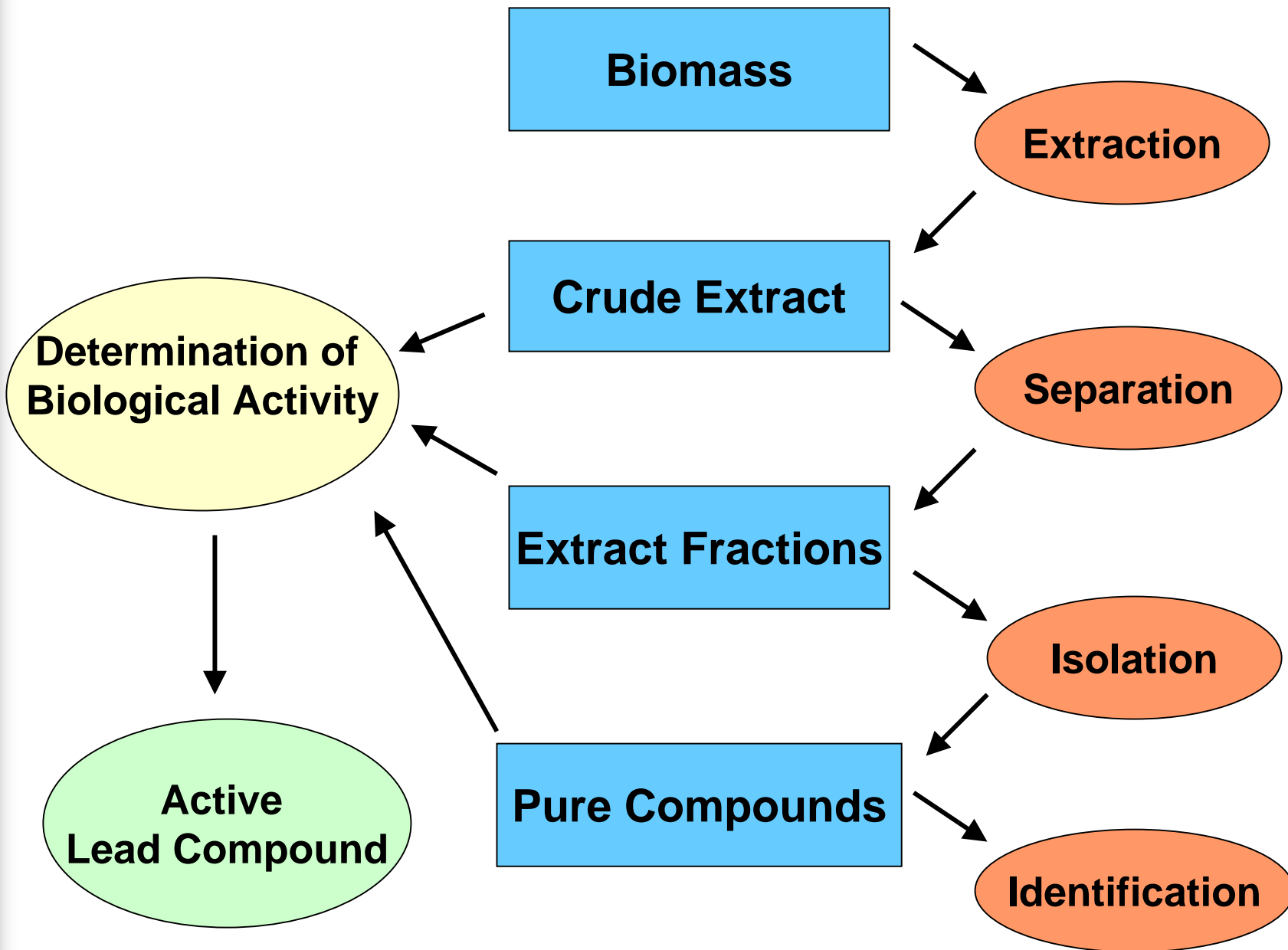


- Loss of potential new medicines



Biological Activity

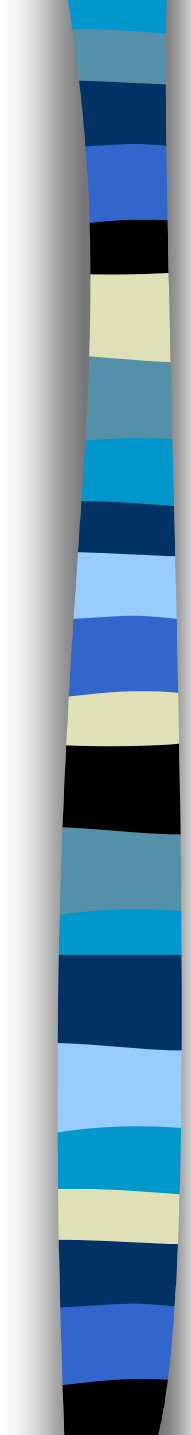
- Major Targets
 - Infectious Diseases
 - Cancers
 - Pesticides





Collection Strategies

- ecological strategy
- ethno-medicinal strategy
- environmental strategy
- taxonomical strategy
- random strategy



Biomass



Extraction

Extraction Methods

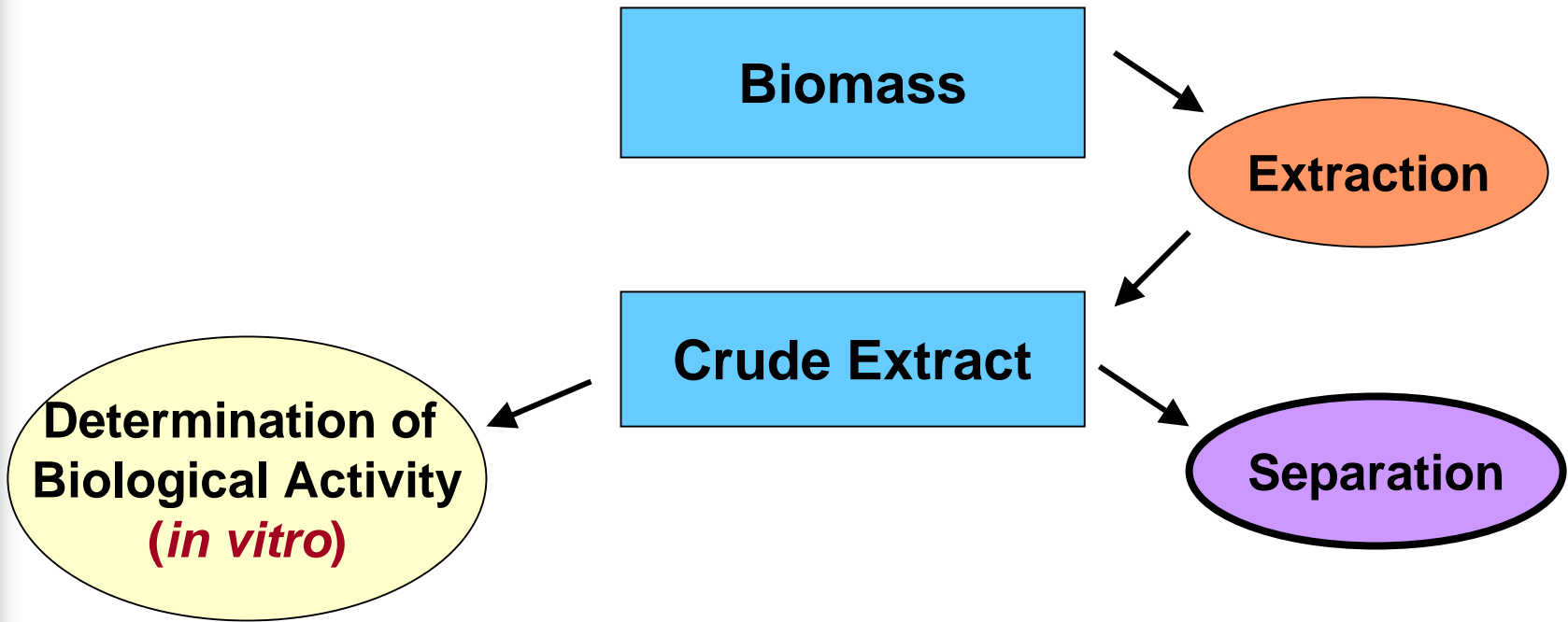


- Solvent extraction
 - at room temperature or higher
 - flowing or non-flowing

Crude Extract



- A complex mixture of unknown components obtained from the biomass
- Separation of the mixture done by the differences in physical or chemical properties





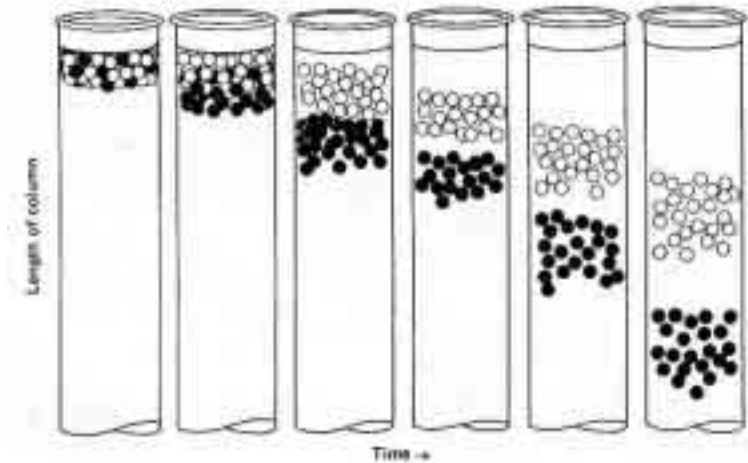
Separation Methods

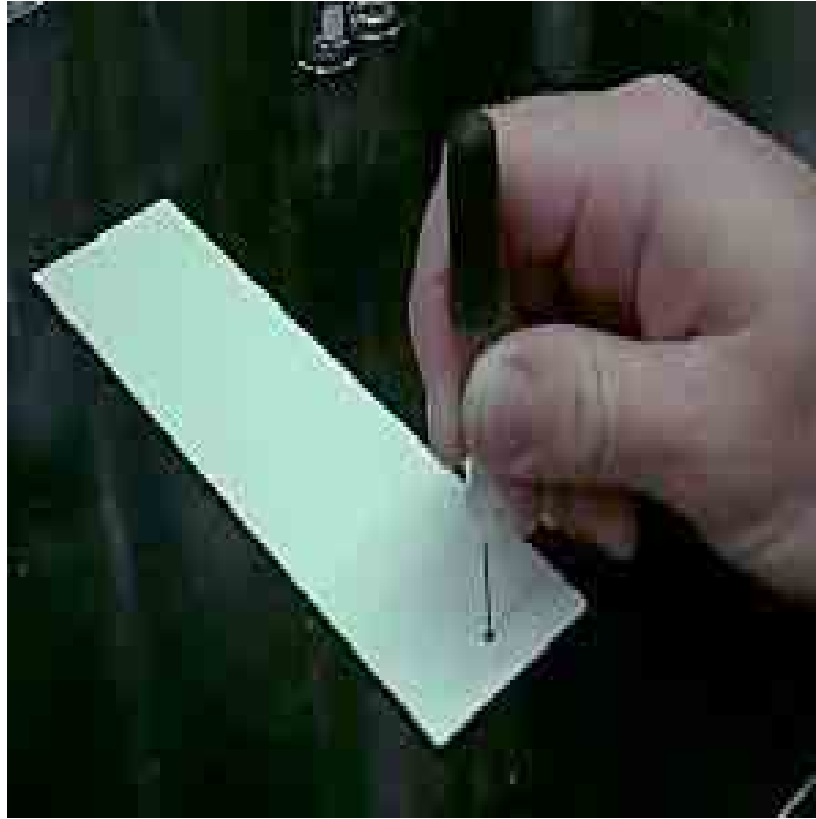
- Centrifugation
- Distillation
- Crystallization
- Filtration
- Chromatography

Chromatography

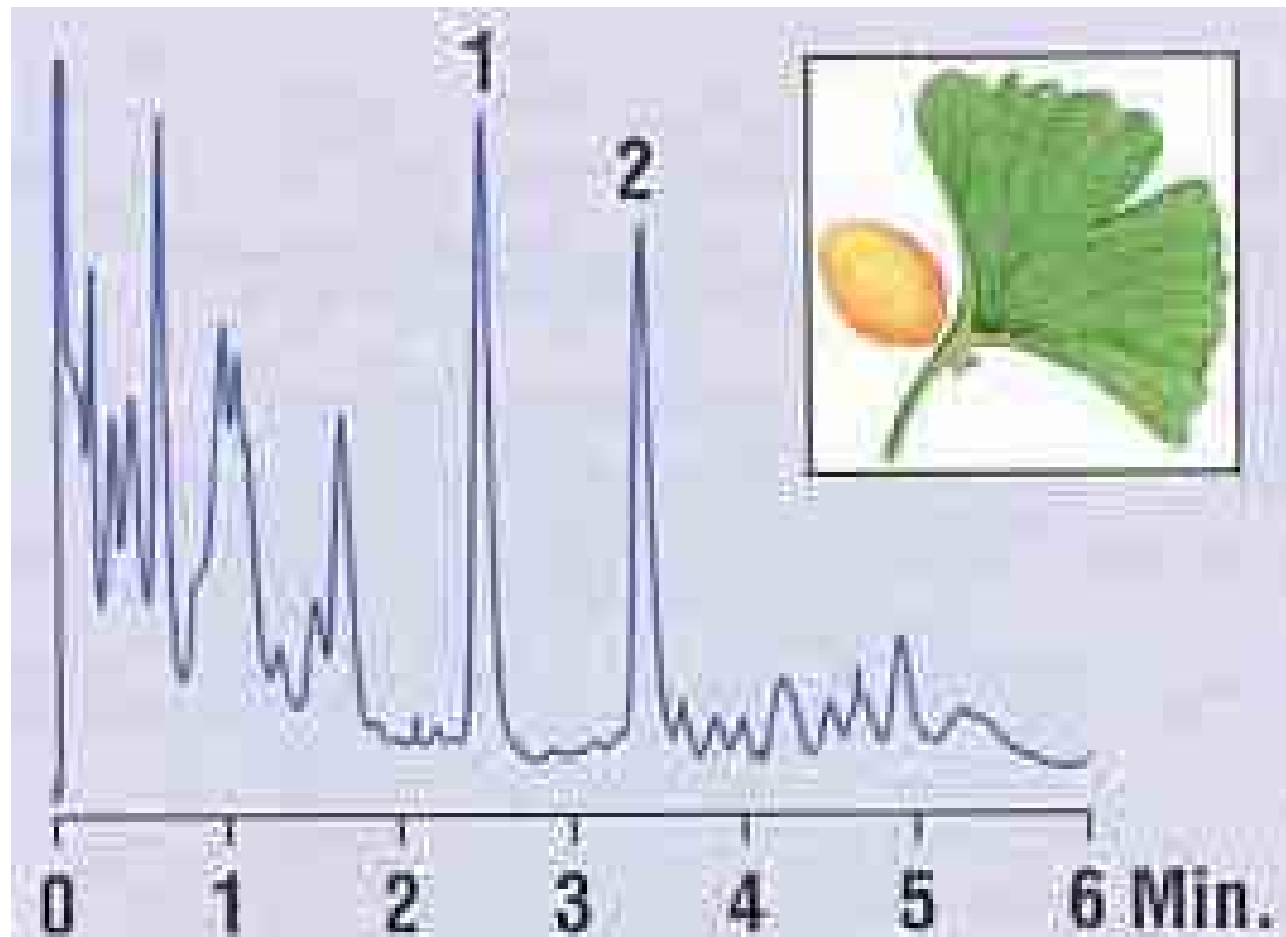
- Basic requirements

- Stationary Phase
 - paper, glass, plastic, gel
- Mobile Phase
 - water, other solvent



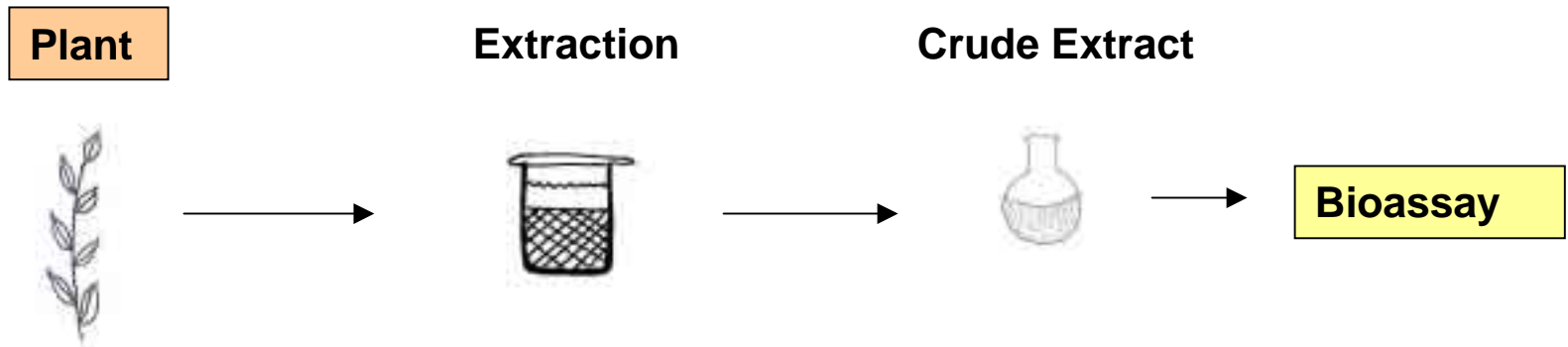


Gingko biloba Extract

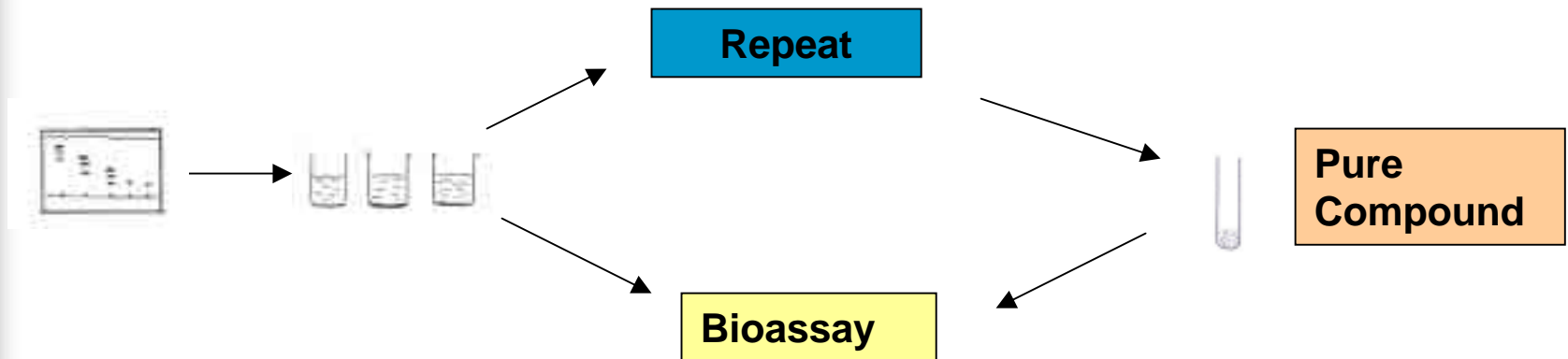


Bioactivity-Guided Separation

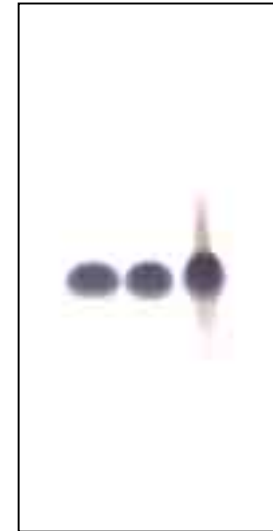
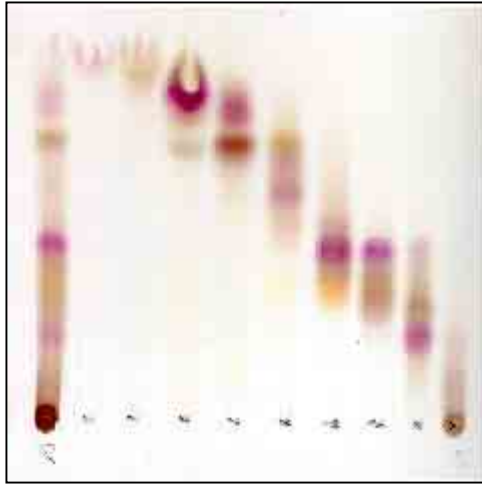
Extraction



Chromatography



Complex Mixture to Single Compound



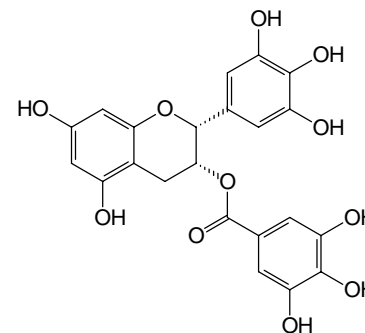
**Active
Compound**



= ?



**Determine
Molecular Structure**

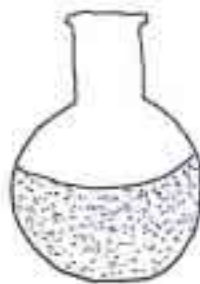


From Plant to Drug

Plant



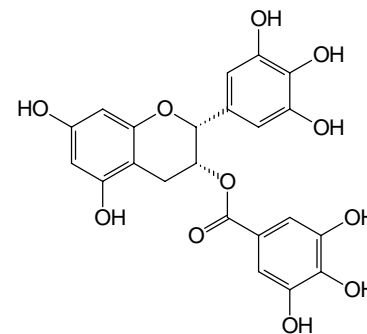
**Crude
Extract**



**Pure
Compound**



**Molecular
Structure**



Biological Activity

