

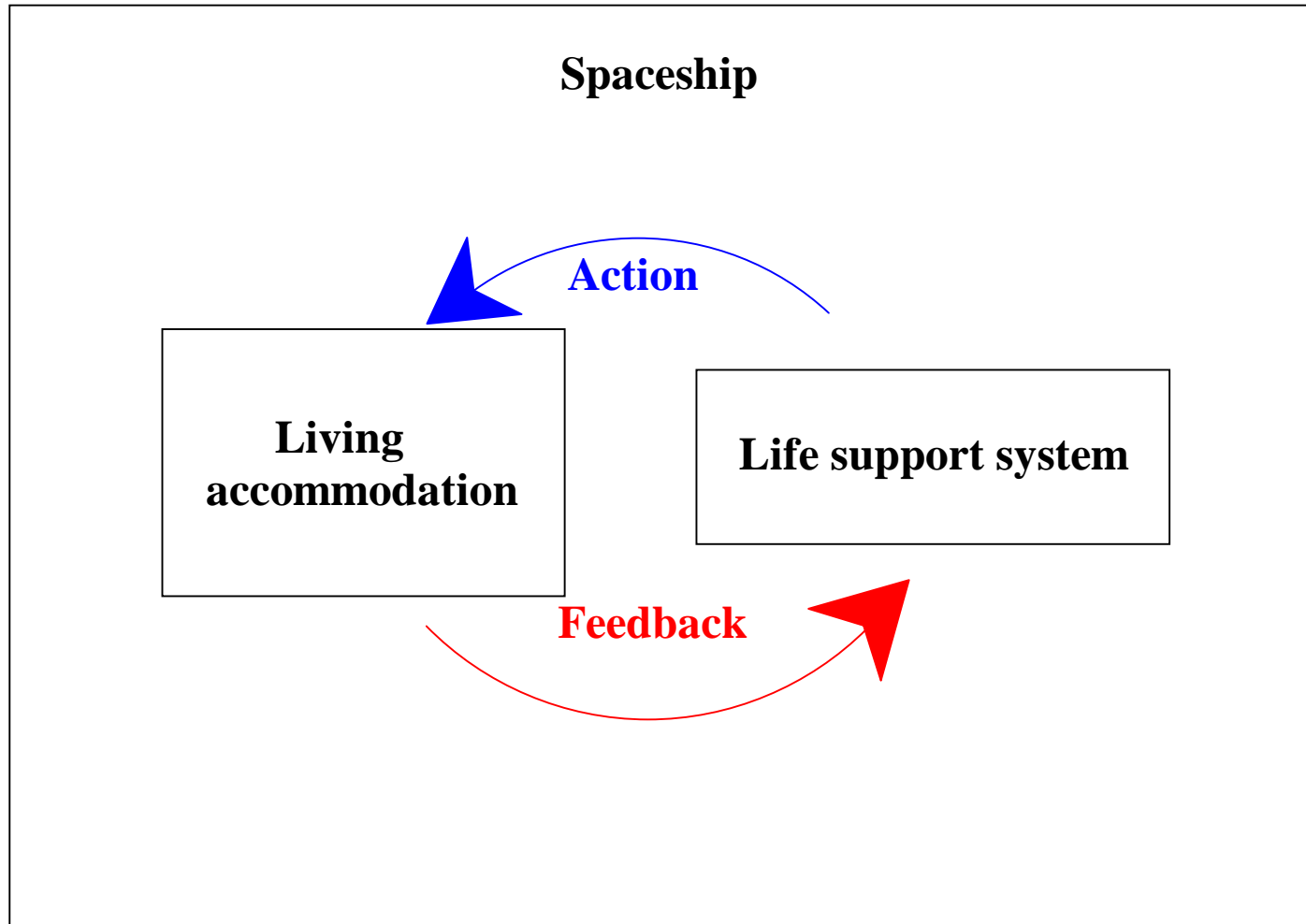
4th International Space Conference
“Space Economy in the Multipolar World”,
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Biosensors and Bioreactors for Life Support Systems

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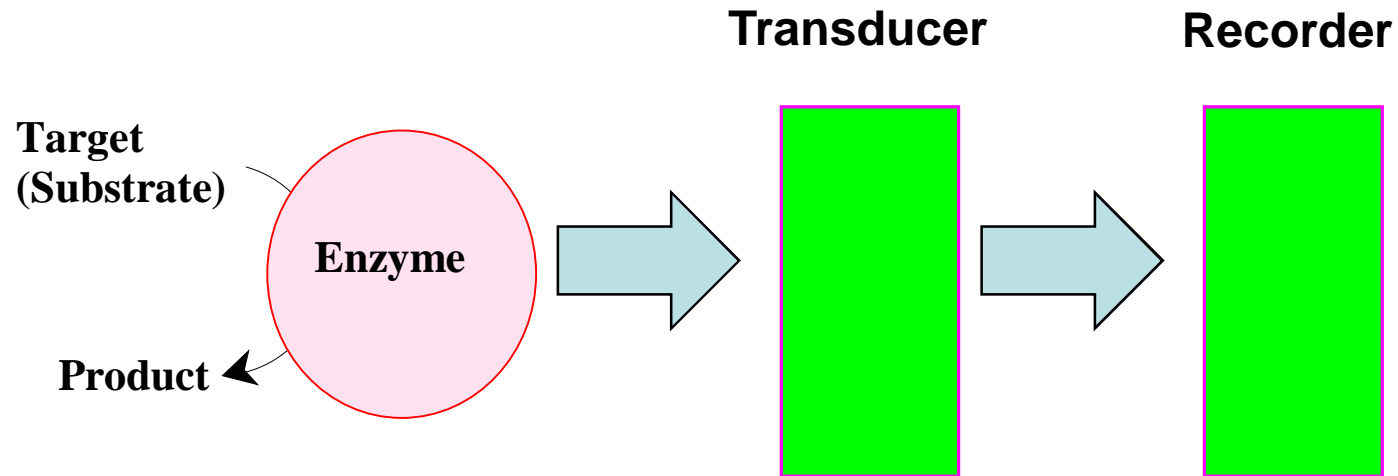
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- **Air condition and climate control (Biosensors)**
- **Remediation of waters and wastes (Bioreactors)**

BIOSENSORS



Biocatalyzer

Glucose oxidase
Cholesterol oxidase
Alcohol oxidase
Lactate oxidase
Uricase
Urease
Laccase

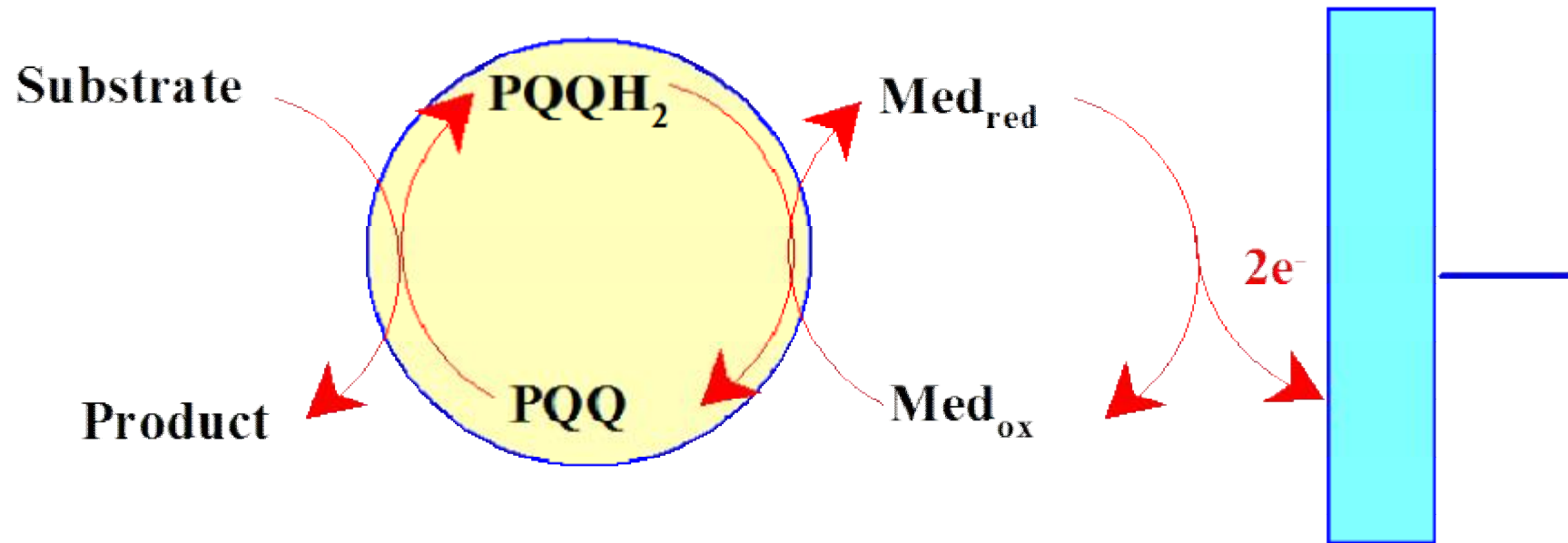
Invertase + Mutarotase + Glucose oxidase
Mirosinase + Glucose oxidase

Target

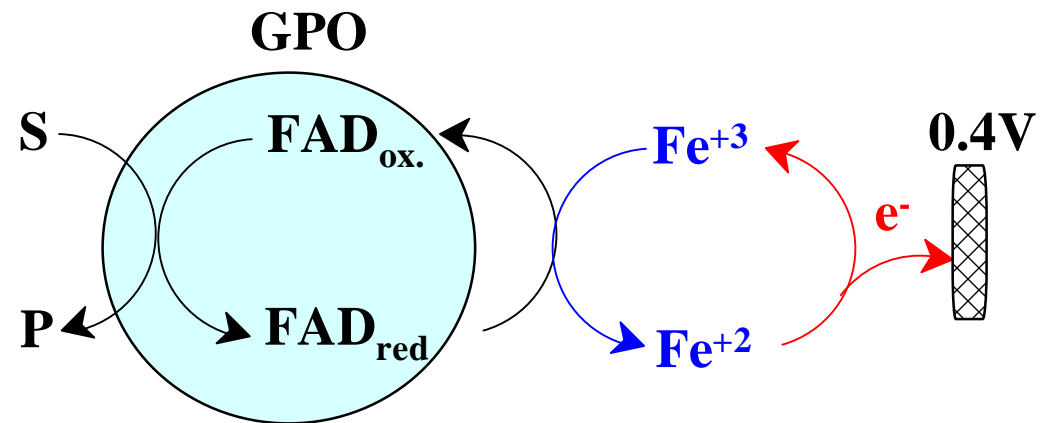
Glucose
Cholesterol
Ethanol
Lactic acid
Uric acid
Urea
Polyphenols

Sucrose
Glycosinoliates

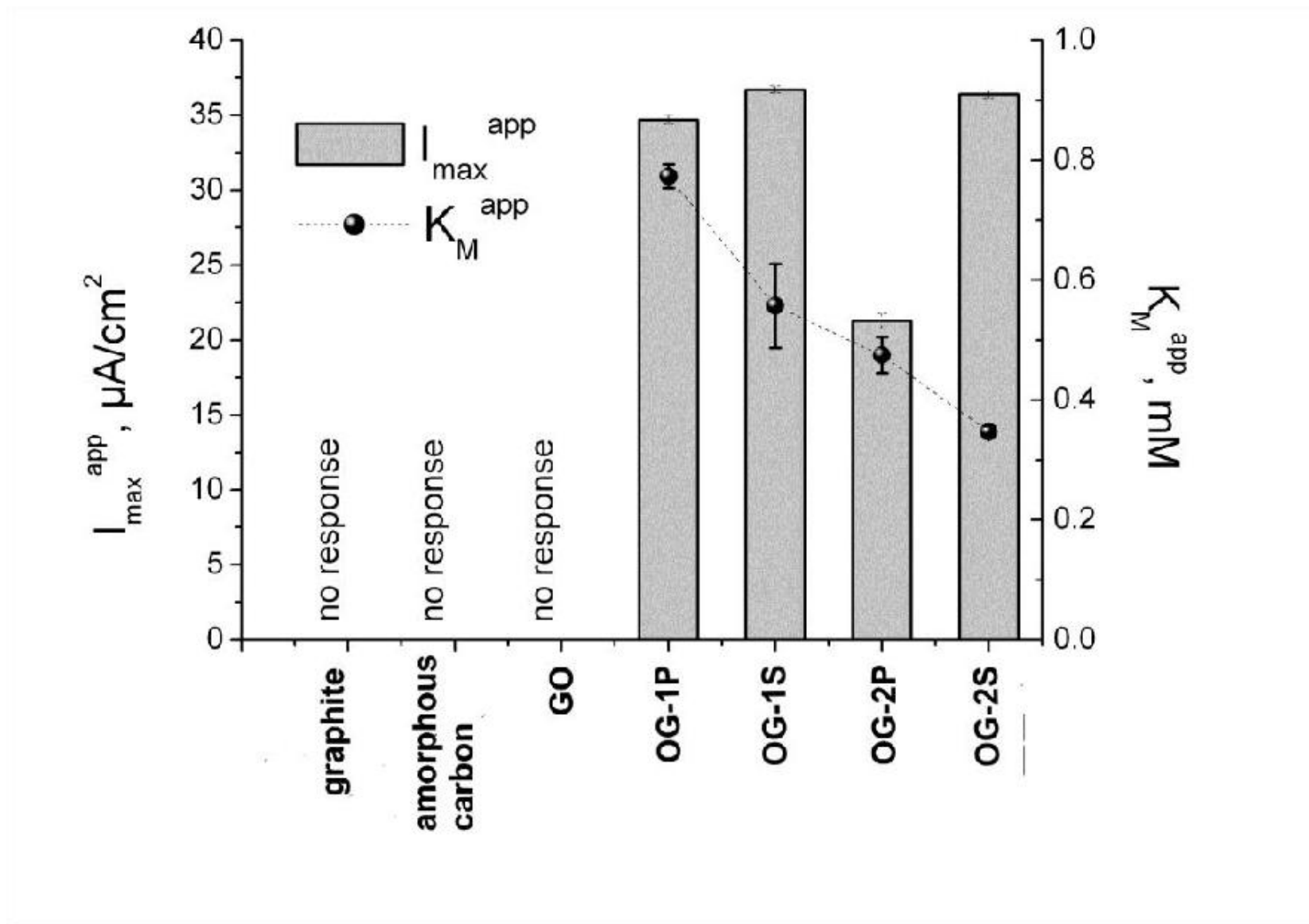
BIOSENSORS



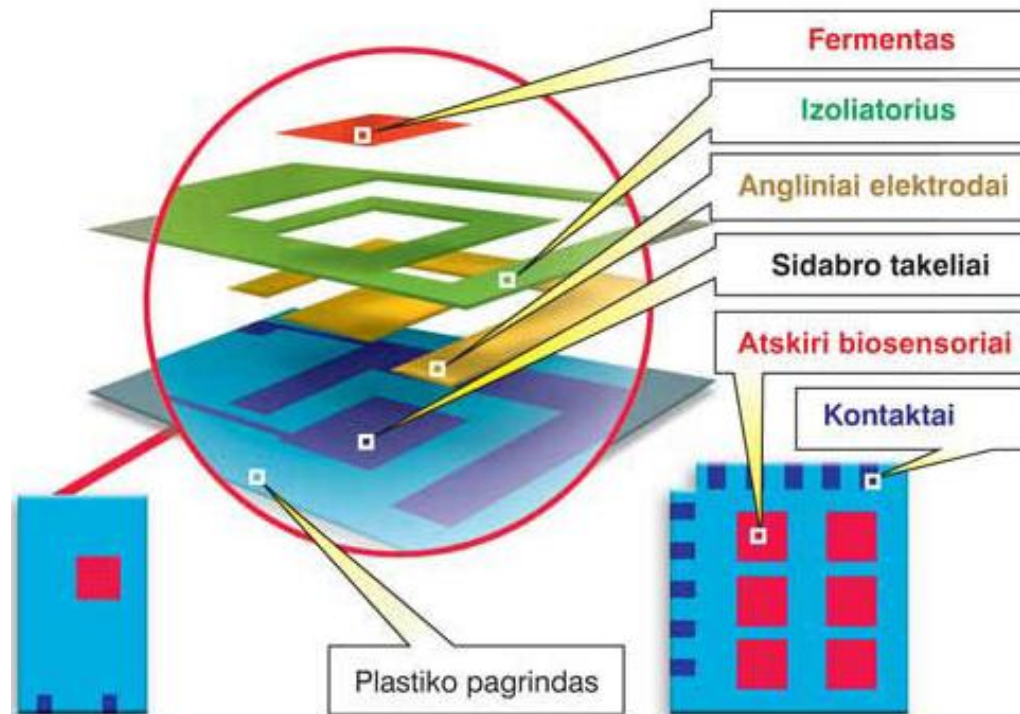
ACTION OF BIOSENSOR IN ABSENCE OF OXYGEN



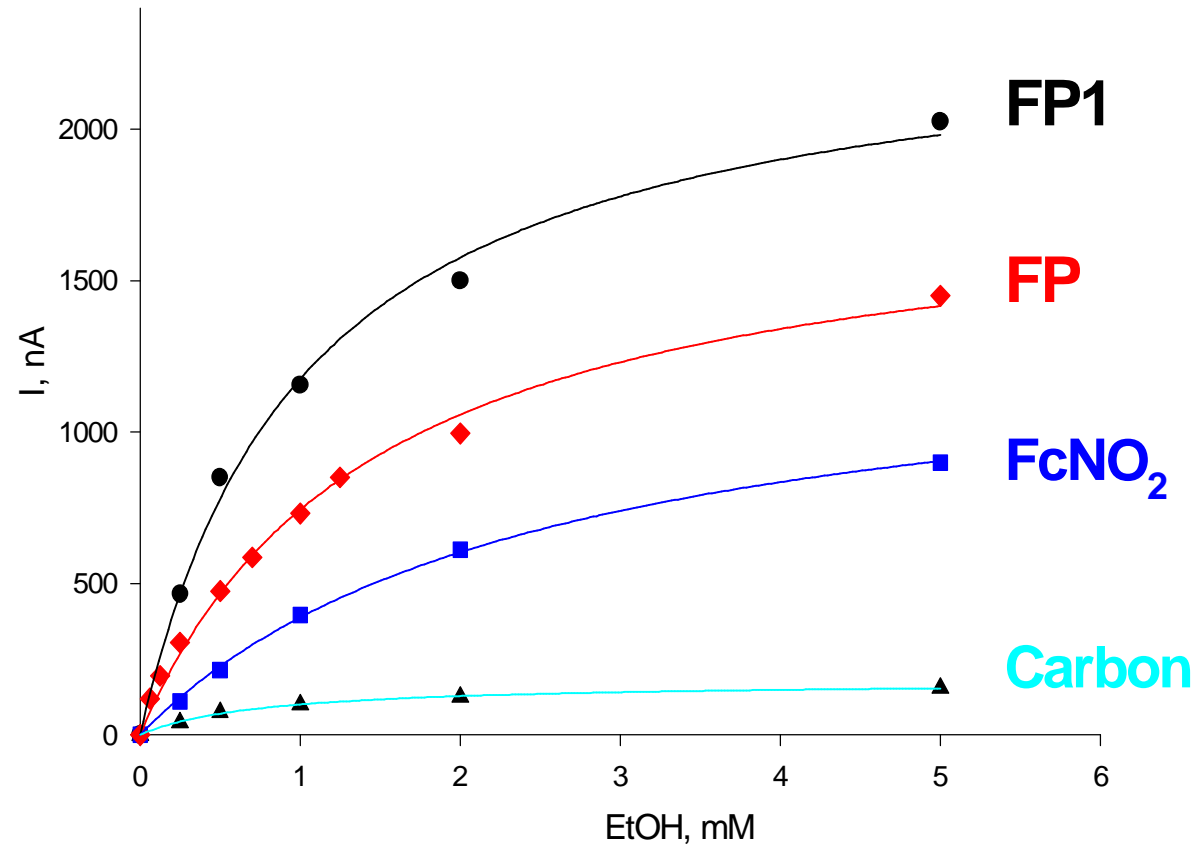
The response of the biosensor to glucose. The biosensor was based on synthesized carbon materials and immobilized soluble PQQ-Glucose dehydrogenase.



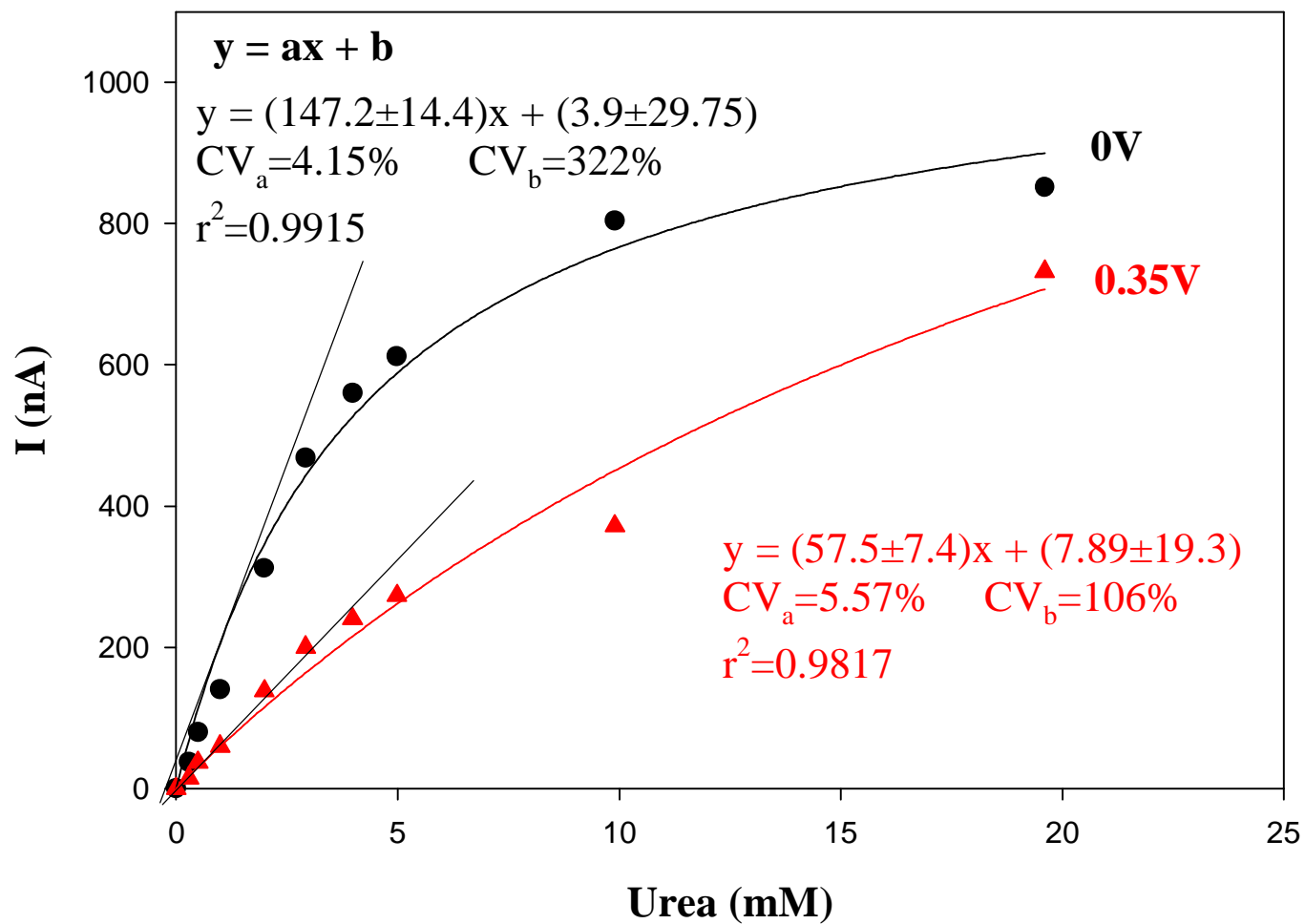
Construction of the screen printed electrode



Calibration curves of ethanol biosensors

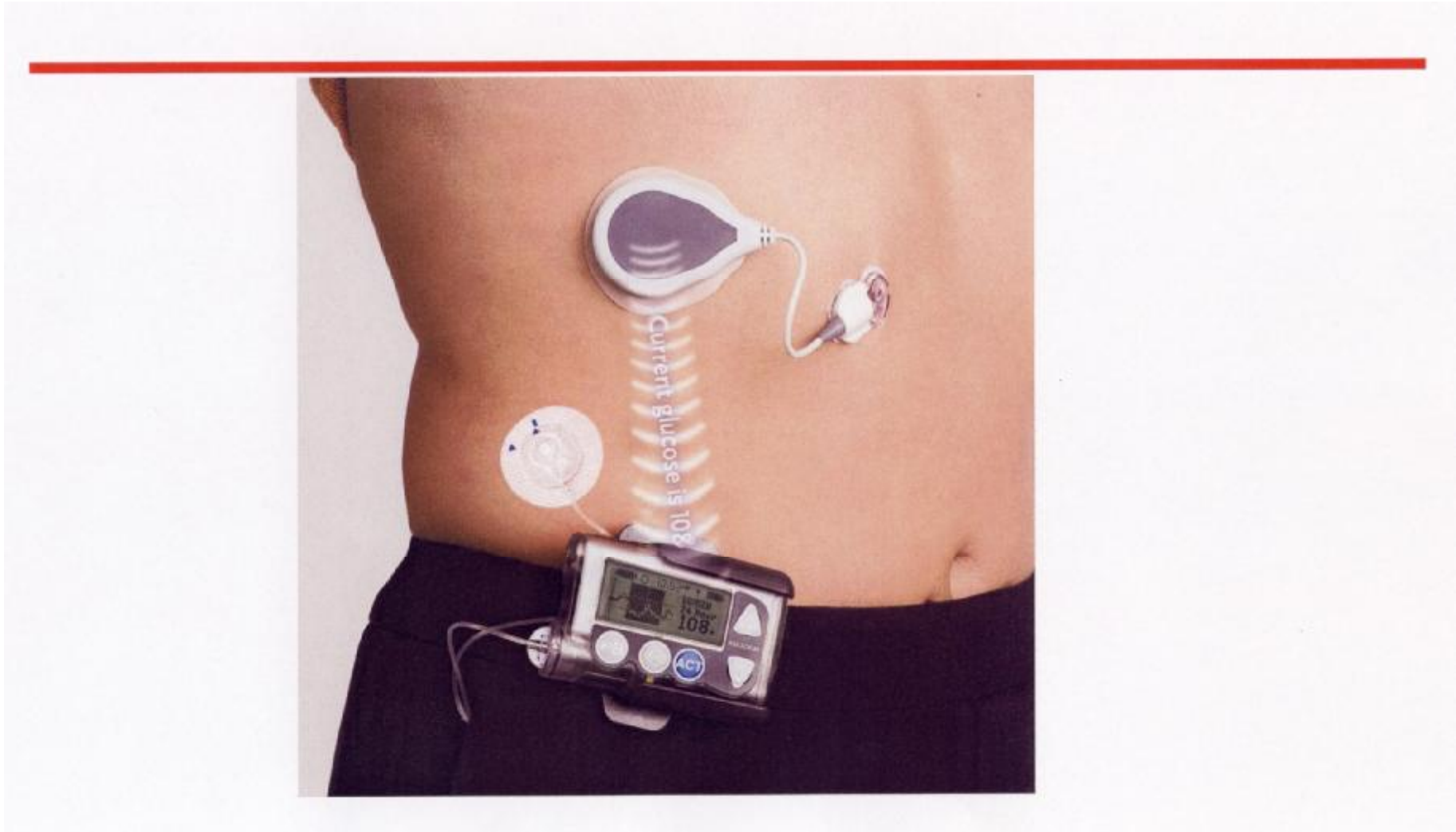


Calibration curves of urea biosensor

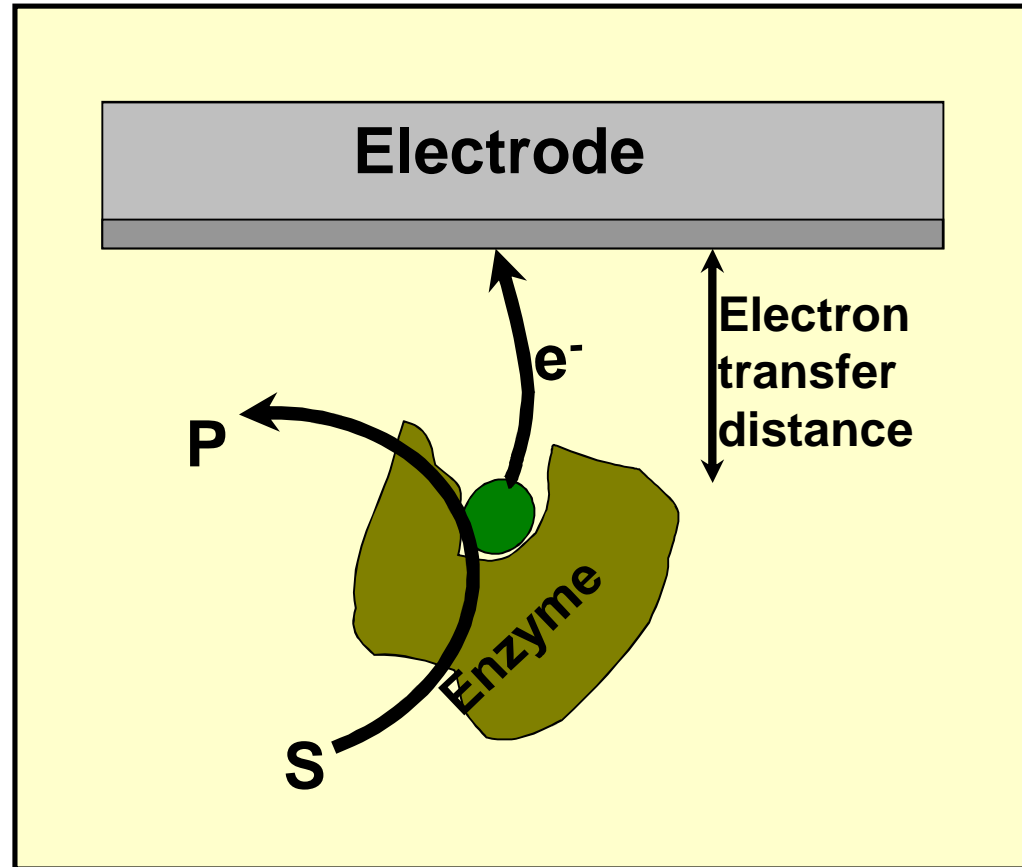


Implantable Glucose Sensor

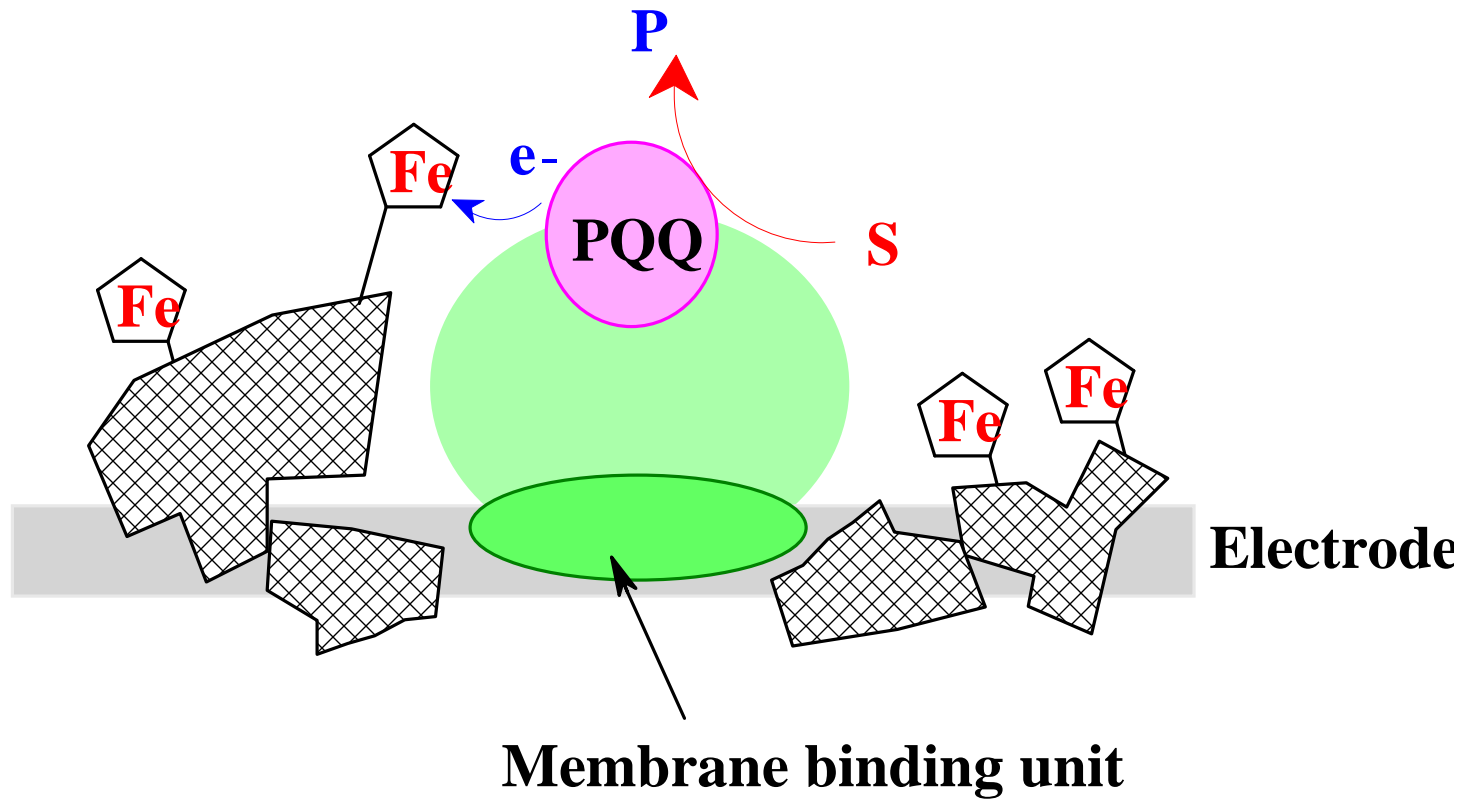




Reagentless biosensors



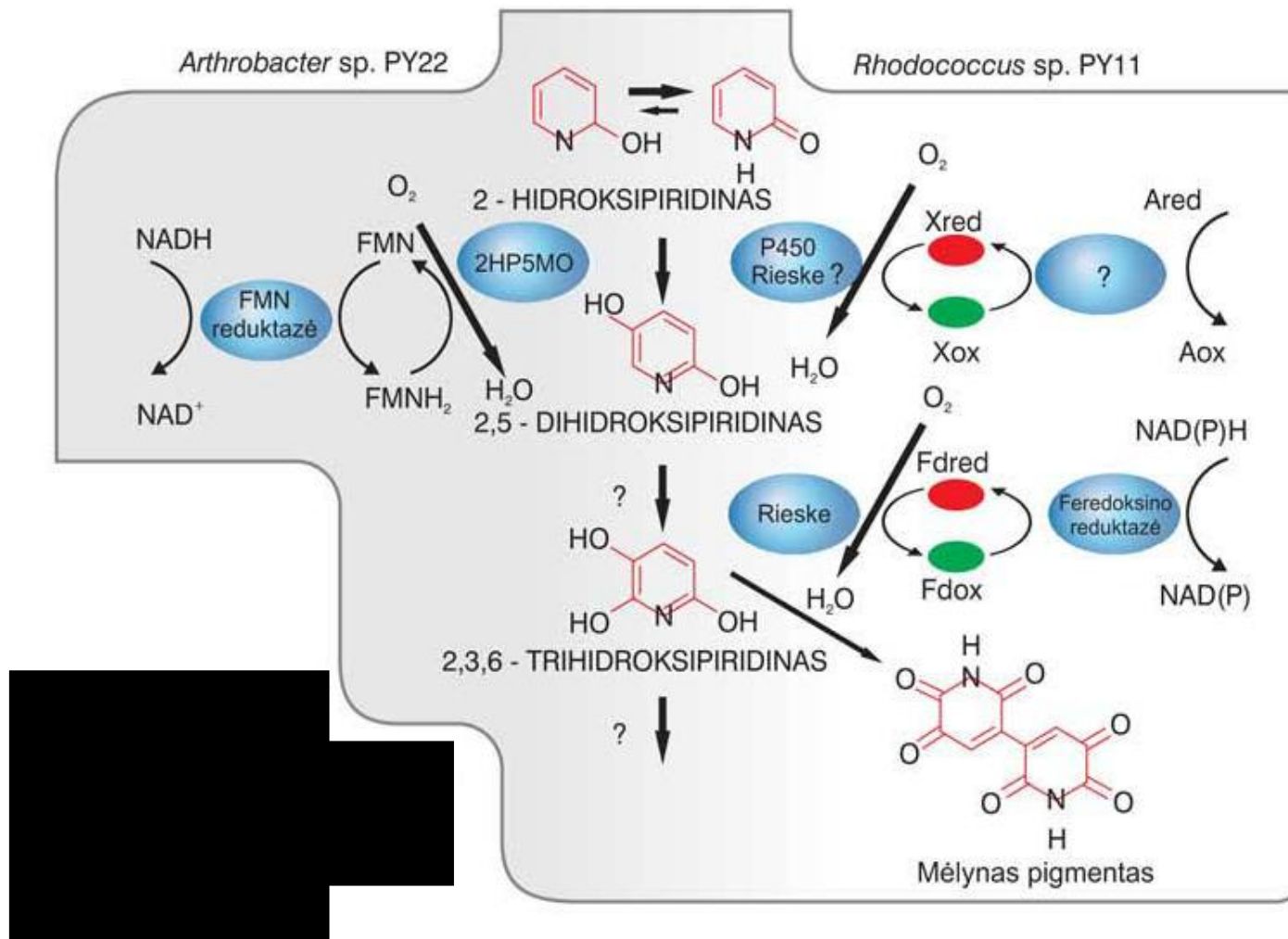
Direct electron transport



Biodegradation - chemical dissolution of materials by **bacteria or enzymes and polyenzyme complexes.**

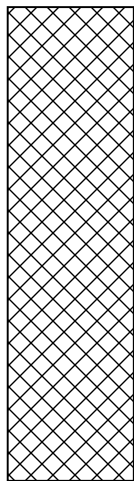
Bioremediation - application of any organism metabolism to remove pollutants (**Bacteria, enzymes, polyenzyme complexes**) .

Investigation of biodiversity of microbial degradation of arenes and heterocyclic compounds



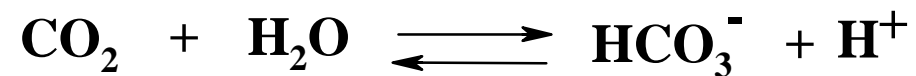
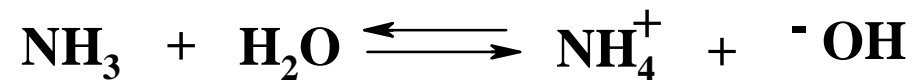
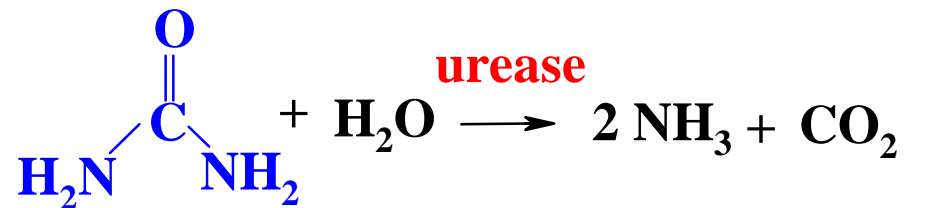
BIOREACTORS

Waste waters (Urea)

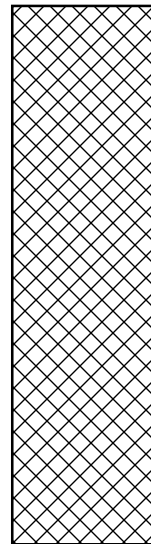


Water + Ammonia + Carbon dioxide

Column with
immobilized
urease



Waste waters (Polyphenols)



**Column with
immobilized
laccase**



Water + insoluble polymer

**Phenolic
compounds**

Laccase



Insoluble polymeric resin

Thank You for your attention!