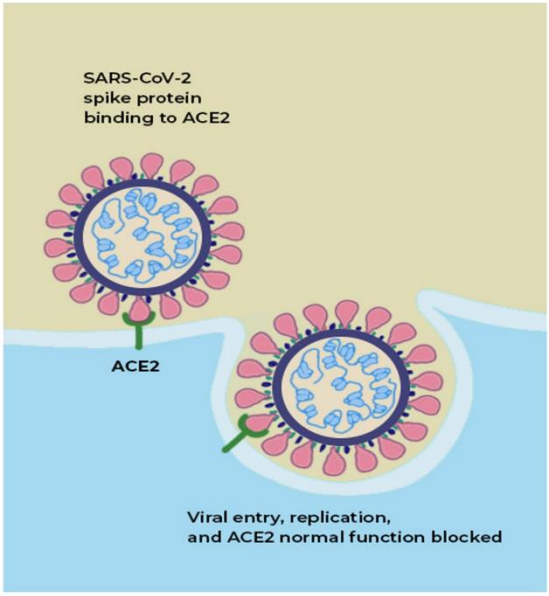
INTRODUCTION to BIOSENSORS

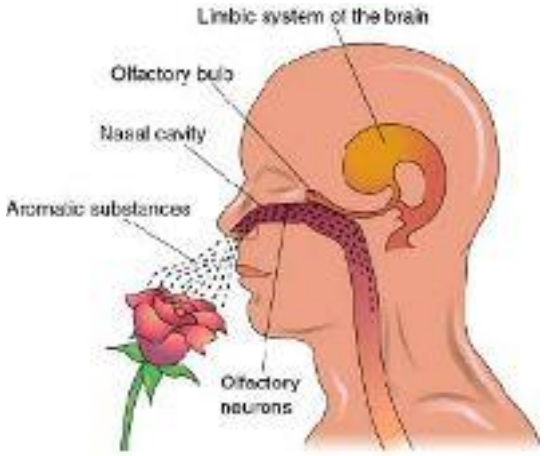
BIOSENSOR

Analytical tool… small (portable), simple (capable of using by semi-skilled operators or patients themselves), reliable, and inexpensive



Performance factors:

- ❑ Selective
- ❑ Fast response
- ❑ Sensitive (sub-milli molar),
- ❑ Accurate (> +/- 5%)
- ❑ Reproducible
- ❑ Independent of physical par
- ❑ Short recovery time
- ❑ Functionally Stable (operation and storage).



- ➢ Decentralized testing facility : PoC, home diagnosis, & onsite applications.
- ➢ Suitable for remote locations in resource limiting environments.

CRITERIA THAT SUPPORT COMMERCIAL SUCCESS

- Multiplex detection facility (simultaneous detection of different analytes from a single specimen) for PoC applications.
- Non-invasive clinical samples: Saliva, sweats, tears, etc.
- Integration of wireless technology… mobile phone, WiFi, blue tooth, IOT etc

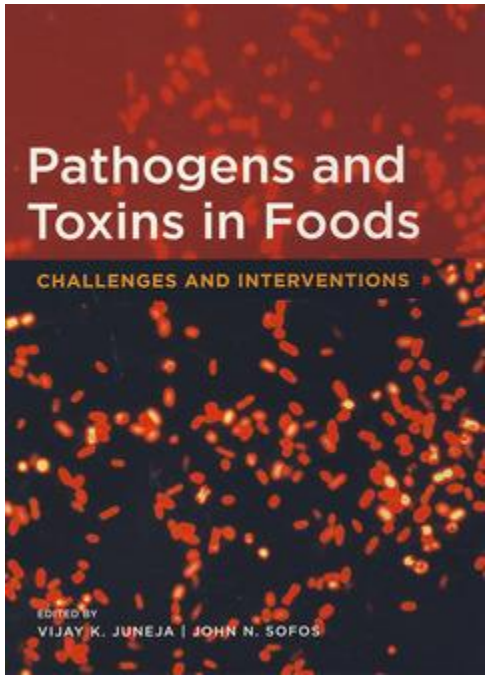
For disease diagnosis in underdeveloped and developing countries:

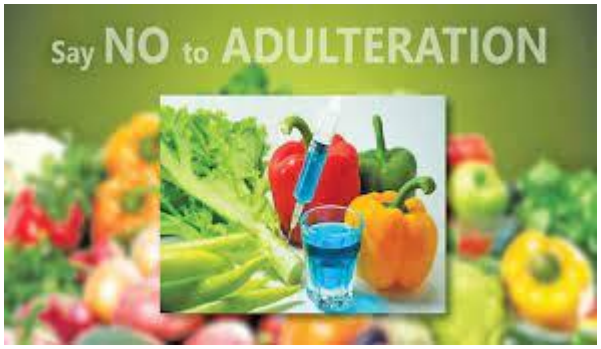
- WHO suggested **ASSURED** (Affordable, Sensitive, Specific, User-friendly, Rapid and Robust, Equipment-free, Deliverable to end-users) criteria, particularly for PoC applications.

APPLICATIONS

CLINICAL APPLICATIONS

Potential target / analyte	Diagnosis/Analysis
Glucose	Diabetes
Albumin, creatinine, protein, urea etc	Kidney function
Alk. phosphatase, aspartate transaminase, lac.dehydrogenase etc	Liver function
Calcium, magnesium, phosphorus etc	Health of bone
Lipid, cholesterol, HDL, LDL and triglycerides etc	Cardiovascular status
Sodium, potassium, chloride, etc	Nerve conduction, muscle contraction etc
Mutation in gene	Genetic disorder & prediction of various genetic diseases etc





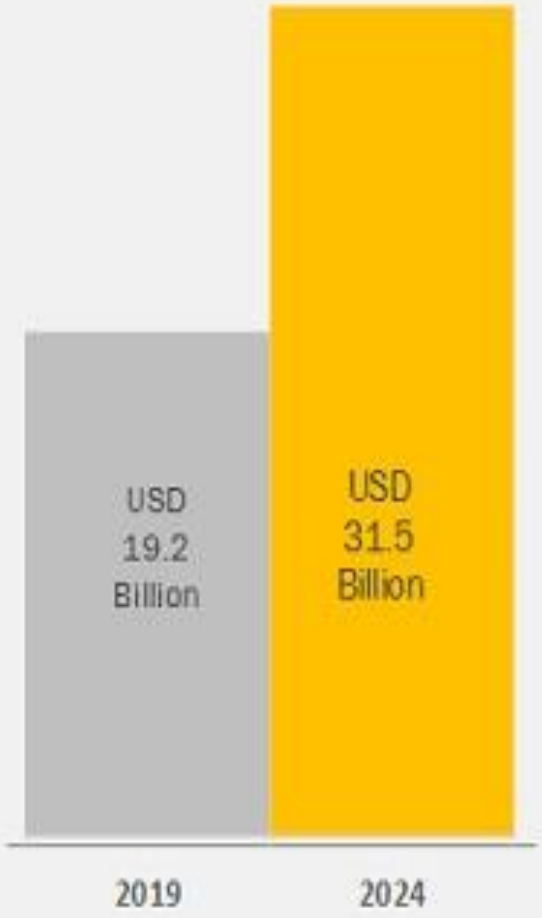
Food & agri products:

Testing tea, coffee, spices (currently electronic nose by using pattern recognition algorithm methods), residual agrochemicals, pesticides, fungicides, herbicides, pathogen, toxins, adulteration,

Water quality: toxic metals, compounds, pathogenic organisms, toxins etc.

Detection of plant and animal diseases, Fermentation industry, Military (Biological warfare, explosive etc).

Attractive Opportunities in Bio-sensors Market



CAGR

8.3%

Compound annual growth rate

- The biosensors market is projected to grow from USD 19.2 billion in 2019 to USD 31.5 billion by 2024, at a CAGR of 8.3% during the forecast period.
- The growing demand for glucose monitoring systems is a major factor driving the growth of the overall biosensors market.
- North America contributes to the largest market share in 2019. Prevalent chronic diseases and conditions, such as heart diseases, stroke, cancer, type 2 diabetes, obesity, and arthritis, are among the most common, costly, and preventable of all health problems that are influencing consumers to adopt biosensors for the regular detection of pathogenic activities.

For under developed and developing countries additionally:
Infectious diseases such as, TB, malaria, diarrhea etc.

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~200 companies are active in the field of biosensors.

THANKS