

KEIRONE

Complete Engineering Solutions...

About KERONE

KERONE is one of the most admired and valuable company for customer satisfaction.



KERONE has reported annual revenue of \$18 to \$20 Million , increasing year-on-year.



KERONE is possessing employee strength of more than 280 experts continuously putting efforts for happy industrial engineering solutions



KERONE is possessing experience of 48+ years in engineering excellence.

KERONE is having immense expertise in manufacturing and implementing various types of engineering solutions.

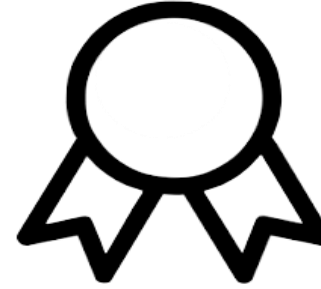
KERONE is possessing employee strength of more than 280 experts continuously putting efforts for happy industrial engineering solutions.





48+

Years Experience



150+

Experts



5000+

Satisfied Clients



280+

Employees

Our Vision and Mission

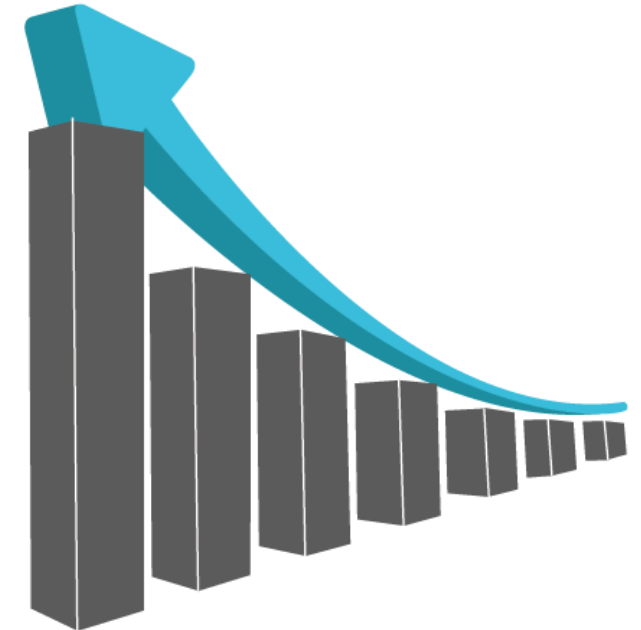


Vision

- Turn into world leader in providing specialized, top-notch quality and ecologically sustainable industrial heating, cooling , drying and engineering solution across the globe.
- To attain global recognition as best of quality and environment friendly engineering solution company.

Mission

- To enhance the value of customer operation through our customer need centric engineering solution.
- We are committed to provide our customers, unique and best in class products in Industrial heating, drying and cooling segment, with strategic tie-up for the technical know-how with renowned leader in the industry specific segment.
- We are company that believes in strong ethics and timely commitment helps to build long term relationship.



Value Propositions



Highly
Customized Product



Sound
Infrastructure



Adherence
to
Standards



Timely
Delivery



Team of experts
Delivering Quality



Cost Effective
Solutions

We are in collaboration with...

Member of AIMCAL



Member of IHEA



Strategic Partners of
Emitech Italy



IRQAO Certified For
Quality



Recognized and Rated by
CRISIL



CRISIL Verified



Member of A.M.P.E.R.E.
(Europe)



ASCB(E) Certification for
Best practice



We are Certified by...

ROHS



VDE



CE



BIS



UL



ISO 9001:2008 | ISO 9001:2015 | OHSAS 18001 | EMS 14001

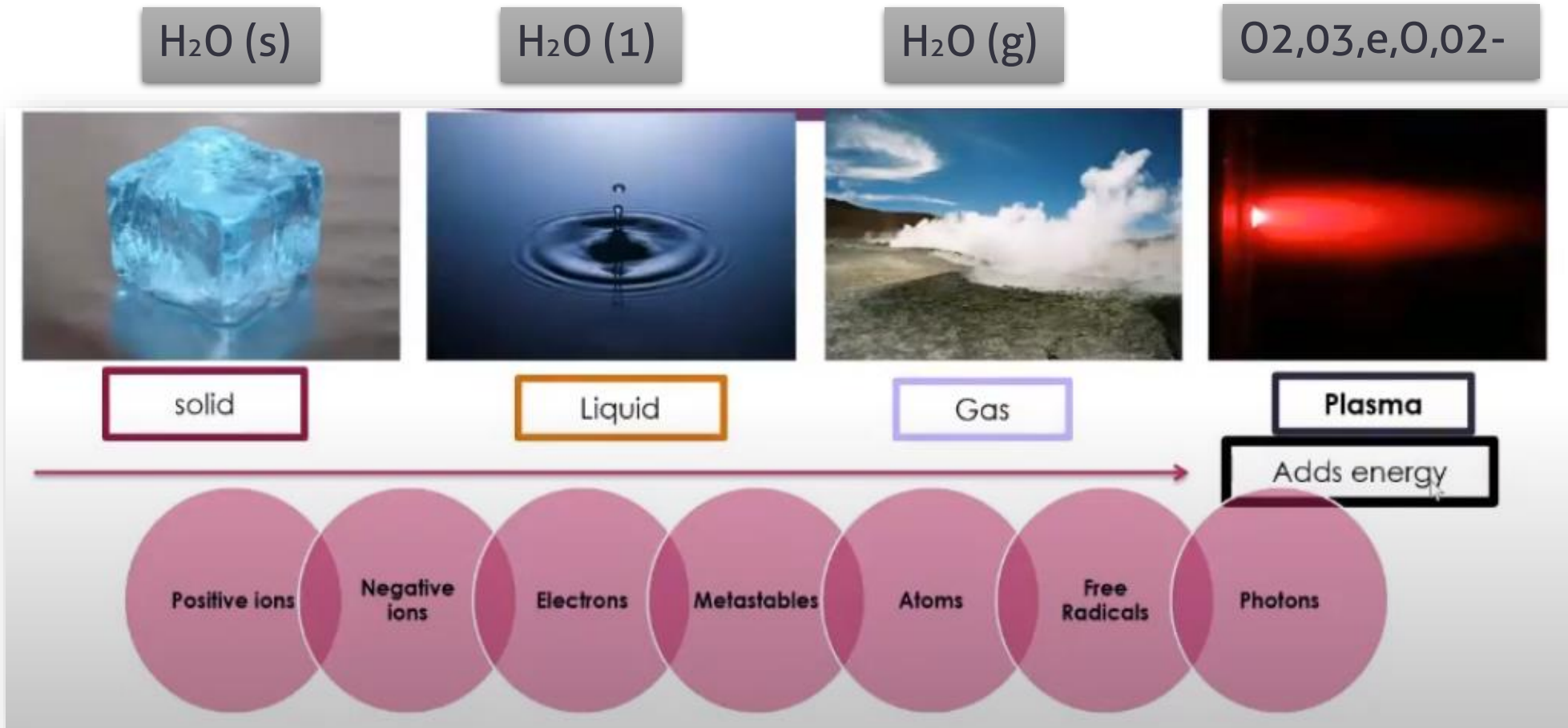
Cold Plasma Non-Thermal Food Processing

Introduction

- Non-thermal processes such as High Pressure Processing, Pulse Electric Field, Ultrasound and Cold Plasma are the emerging trends.
- These are considered as potential alternatives to thermal processes.
- Non-thermal processes may overcome some of the challenges of thermal processing.
- Cold Plasma is one of the non-thermal process which can be easily used across the various sectors including Agri-processing, Food Processing and Bioprocessing.

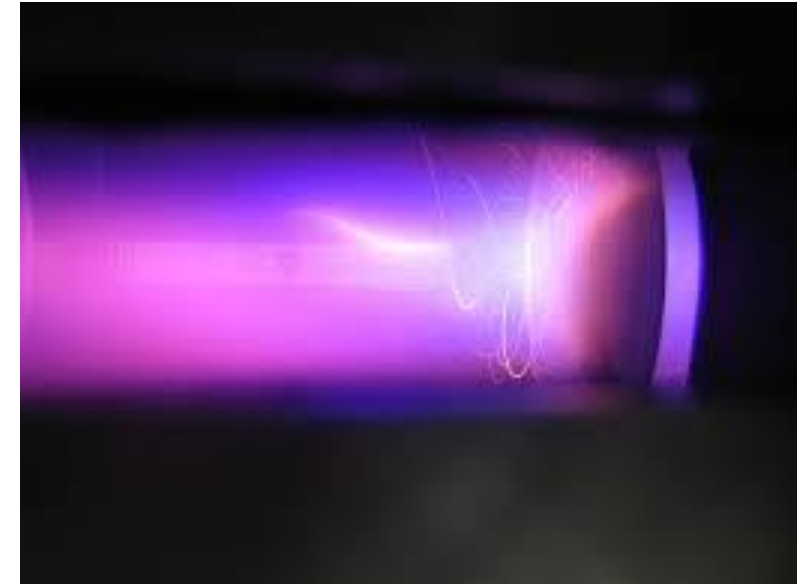


Plasma Is a Fourth State of Matter

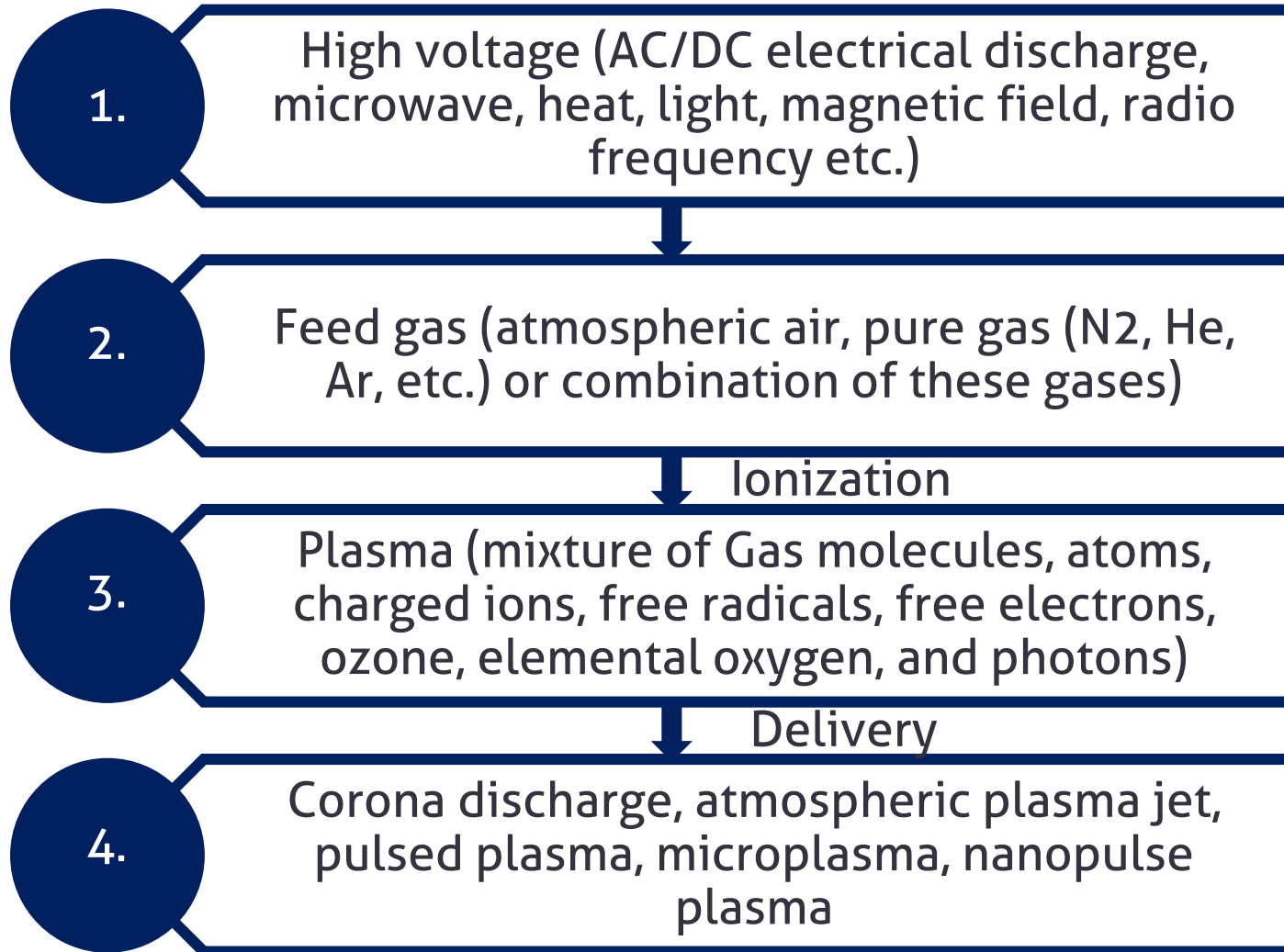


Plasma Chemistry

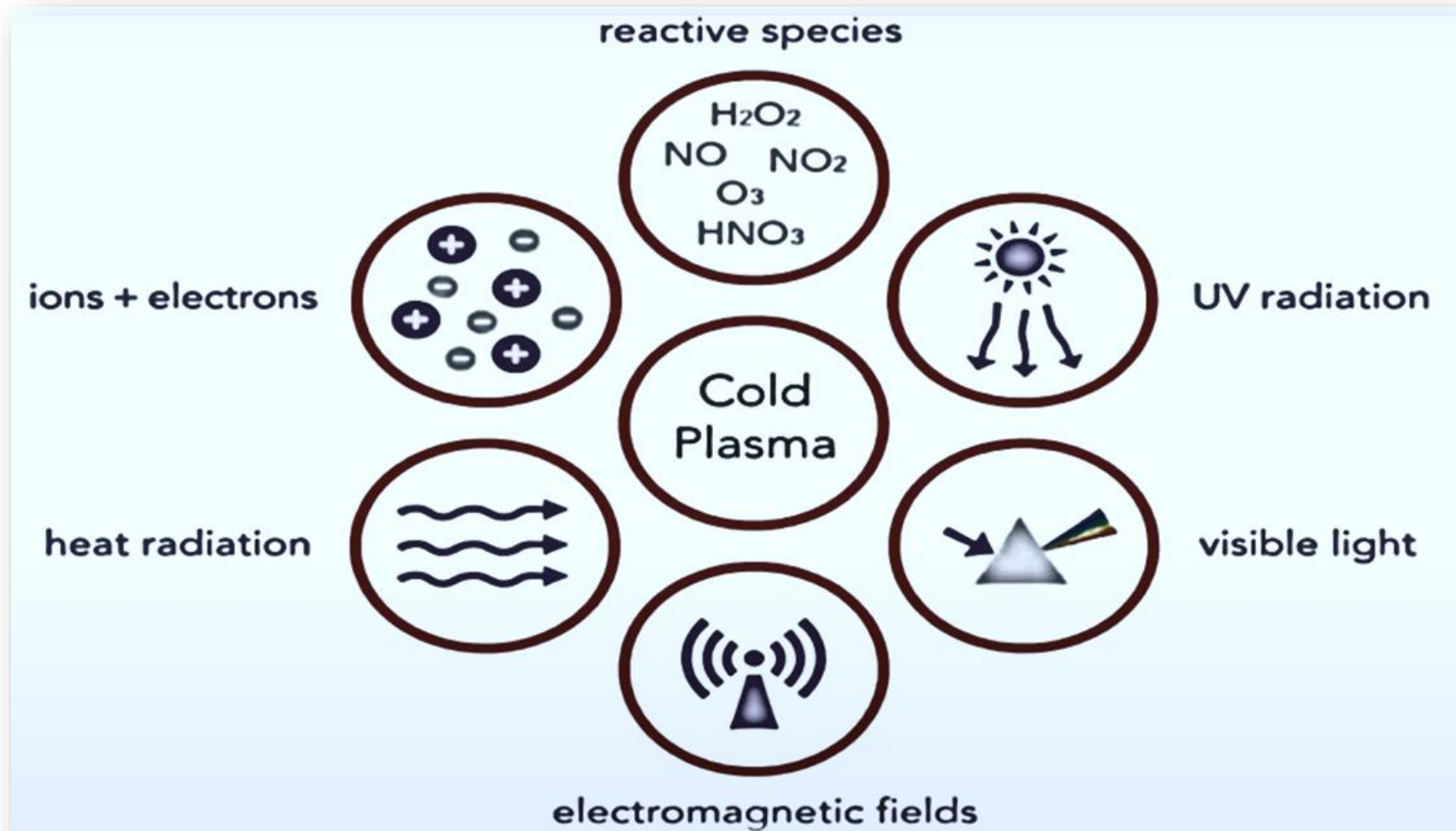
- Ionization is the most important step in the plasma chemistry.
- Plasma chemistry depends on several factors such as feed gas composition, humidity, power and voltage applied and surrounding phase.
- The ionization of neutral, ground-state atoms, molecules, or radicals by electron impact is the most prominent ionization mechanism.
- Chemical composition of air plasma are dominated by O , O_2 , O^+ , N^* , N_2 , NO^+ , CO_2^+ ions.
- When nitrogen in gas phase collide with electrons forms NO_x and oxygen present leads to hydroxyl radicals (OH^*) and ozone.



Plasma Generation: Basic Principle

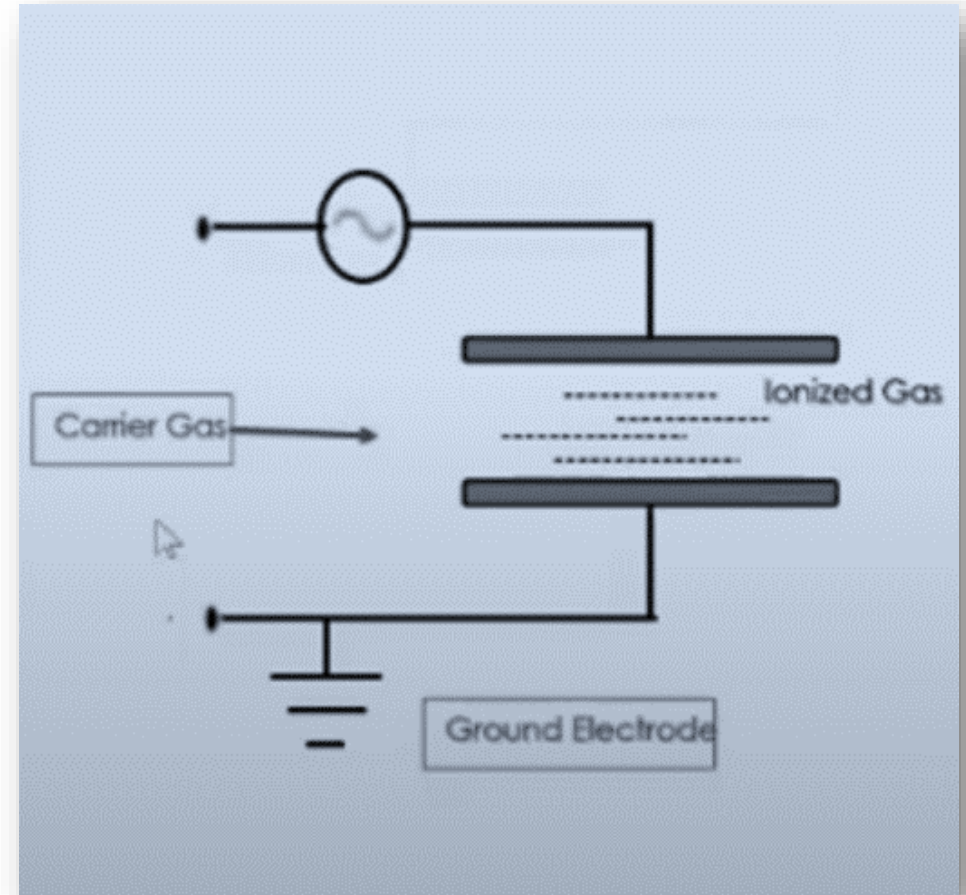


Cold Plasma



Working Principle of Cold Plasma

- Material is kept between 2 electrodes, one is grounded & another is powered.
- Through the gas inlet, gas or gas mixture will occupy the gap/space.
- As voltage increases, current will stress the gas to its dielectric limit into electric breakdown, the gas is ionized.



High Voltage Electrode



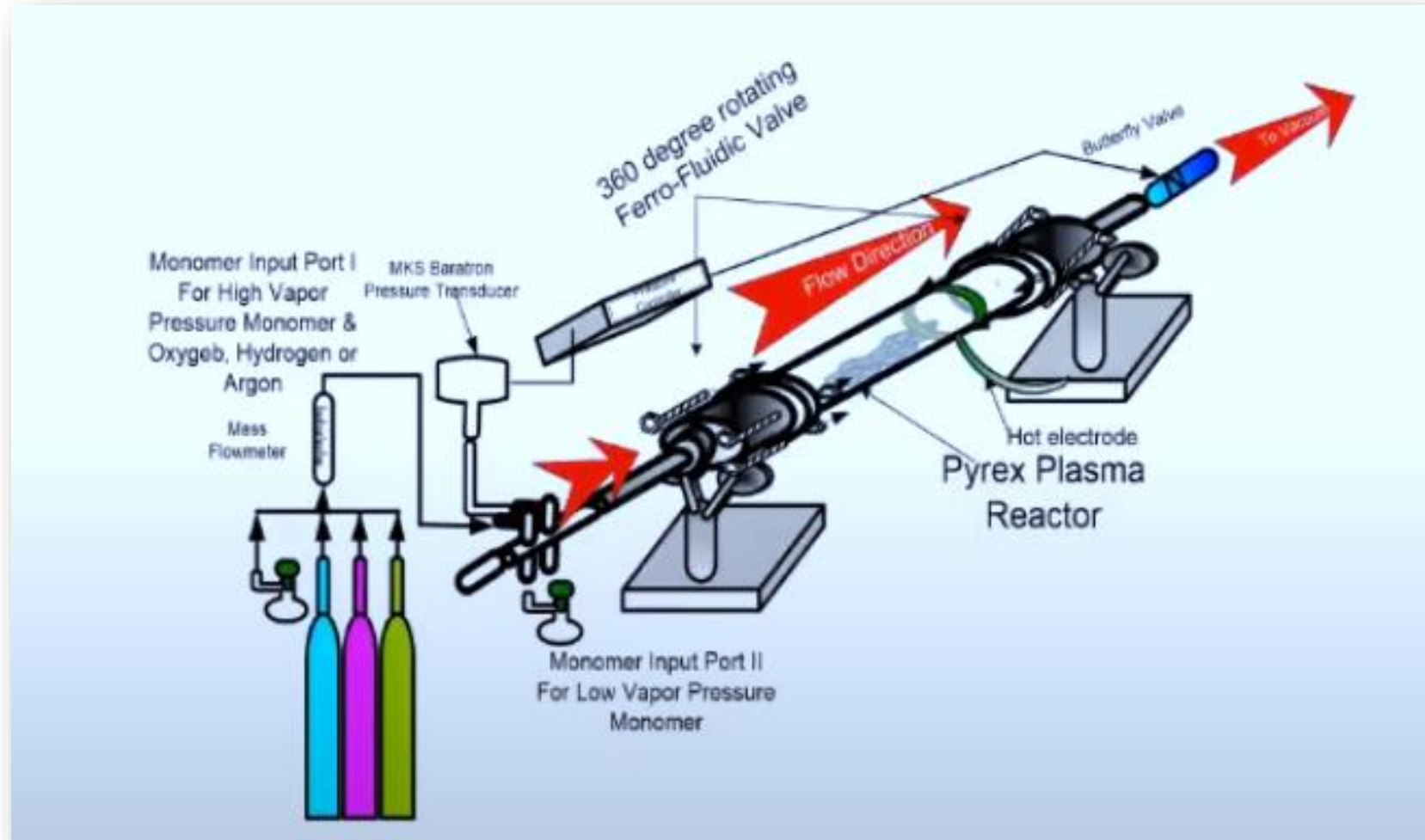
Cold Plasma Generator-Static



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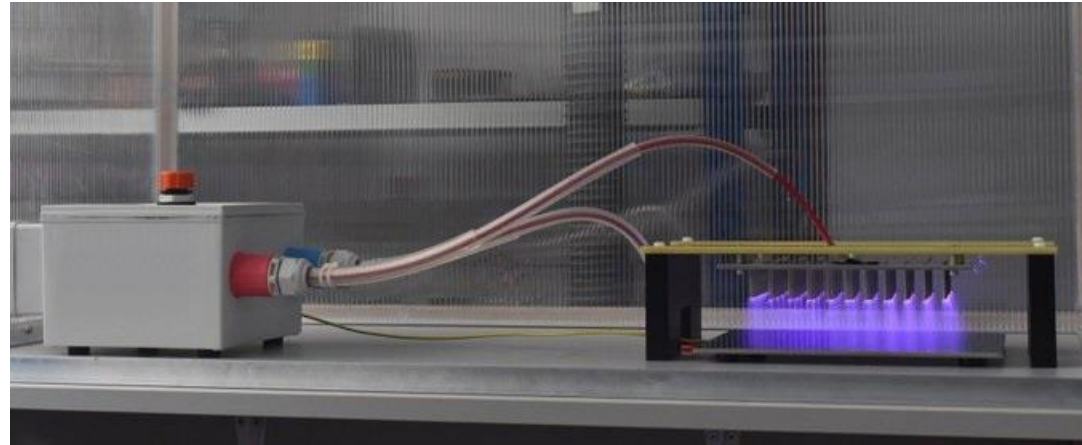
360 Degree Rotating Plasma Generator



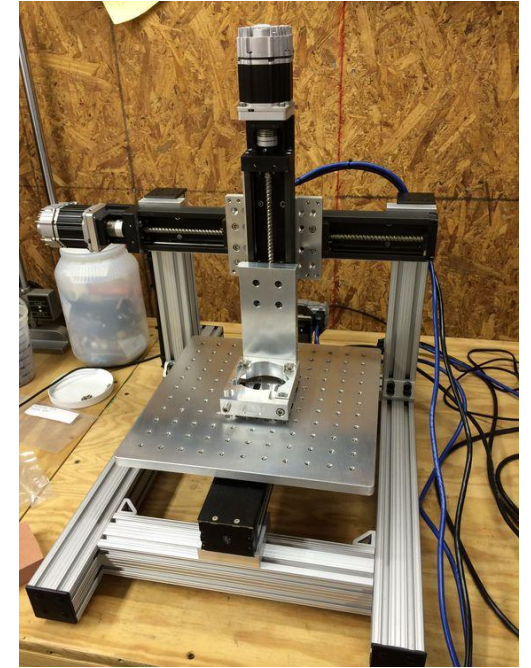
Pin/Jet Plasma



Plasma Activated
Water System



Power Source
And
Pin Reactor



Plasma Jet Working
On Plate



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Applications

- **Medicine**
 - Wound healing
 - Sterilization
 - Dental plaque
- **Water Treatment**
 - Decontamination
 - Pesticide degradation
 - Degradation of Dyes
- **Polymer Science**
 - Surface modification
 - Surface functionalization
 - Sterilization
- **Food Science**
 - Decontamination of mycotoxins
 - Enzyme inactivation
 - Degradation of pesticide residues



Applications in Food and Agriculture

- Cereal & Pulses Industry
- Fruit & Vegetable Industry
- Dairy Industry
- Meat & Poultry Industry
- Spice Industry
- Biopolymers (Surface modification)
- Agriculture (Post Harvest Storage)

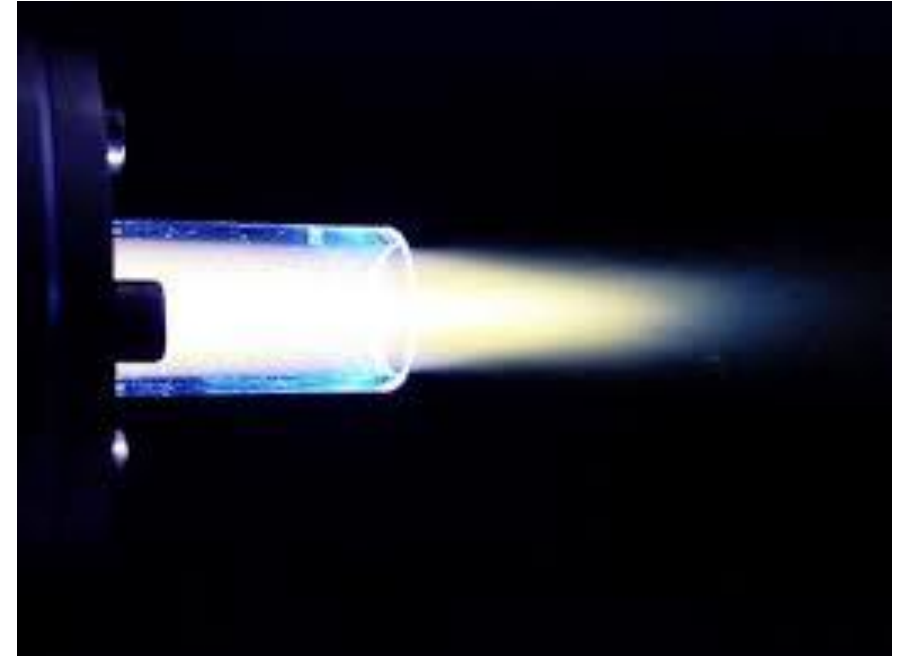
Surface Modifications

- It acts on surface and have limited penetration power
- Plasma is known for surface modification
- Modifies surface morphology by scratching or itching
- May increase hydrophilicity of the material

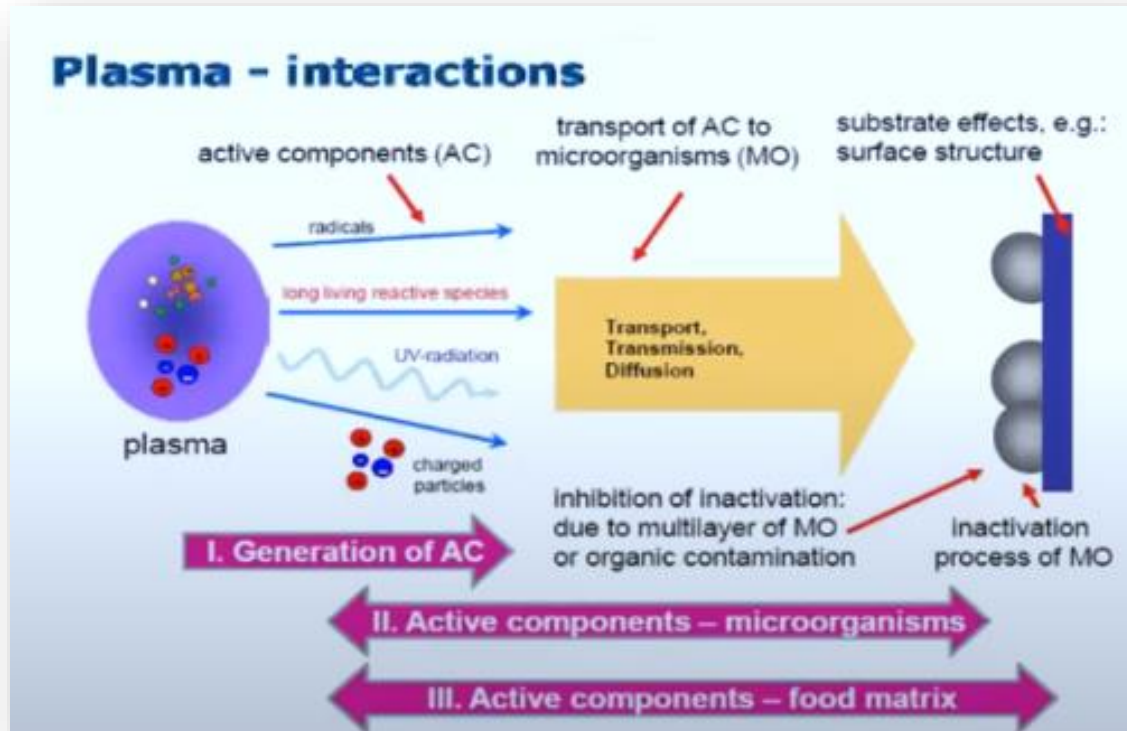


Effect on Microorganisms

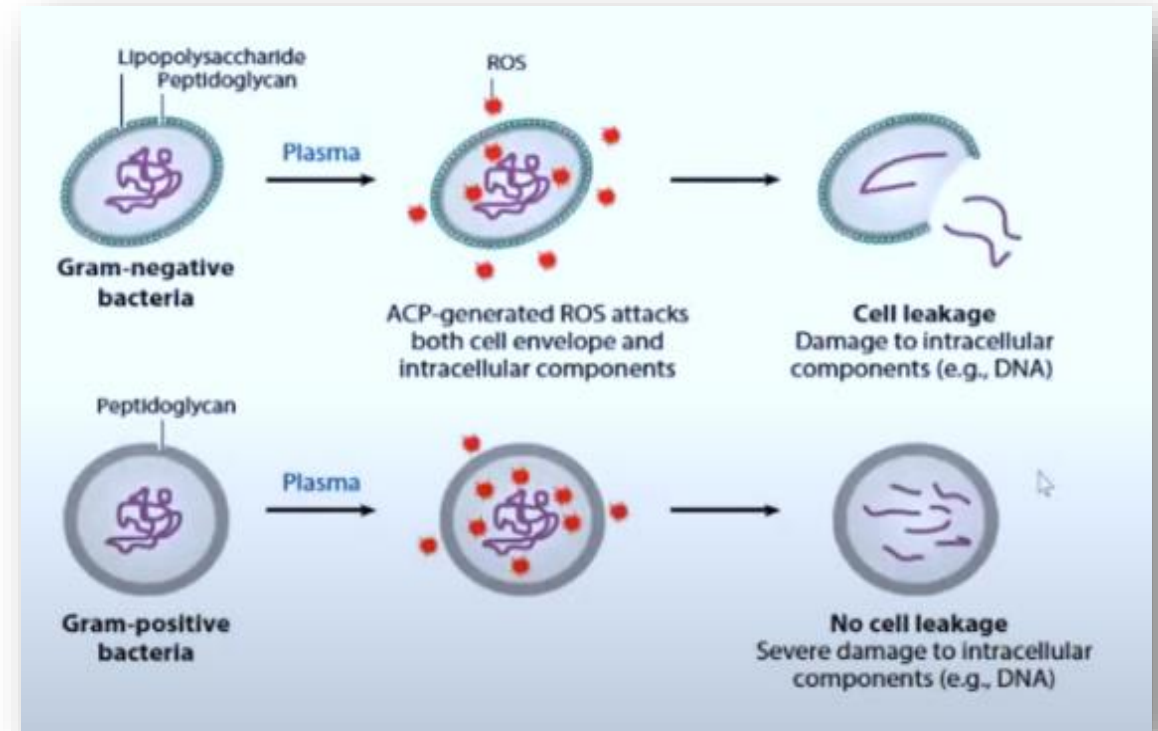
- Deformation and leakage of microbial genetic materials
- Lipid oxidation especially on cell membrane
- Cell wall rupture due to electrostatic forces – Electroporation
- Protein denaturation, oxidation of amino acids and nucleic acids



Microbial Inactivation



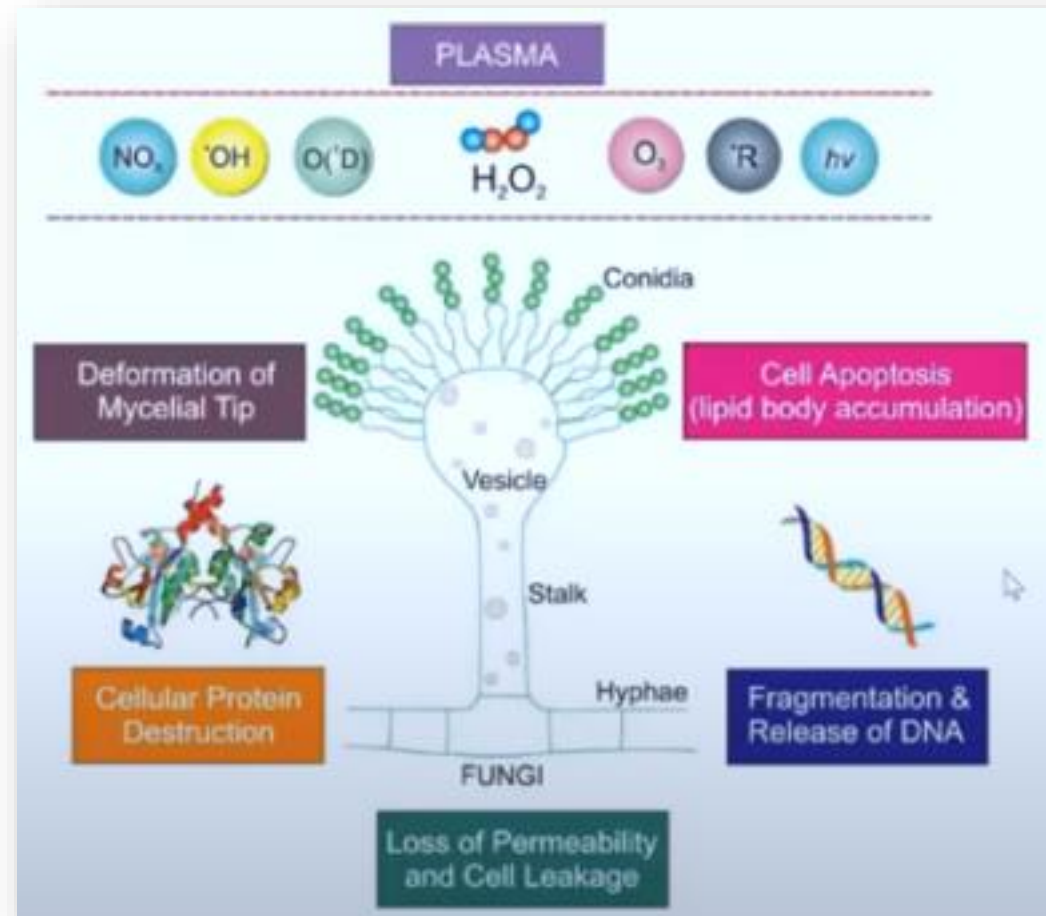
Mechanism



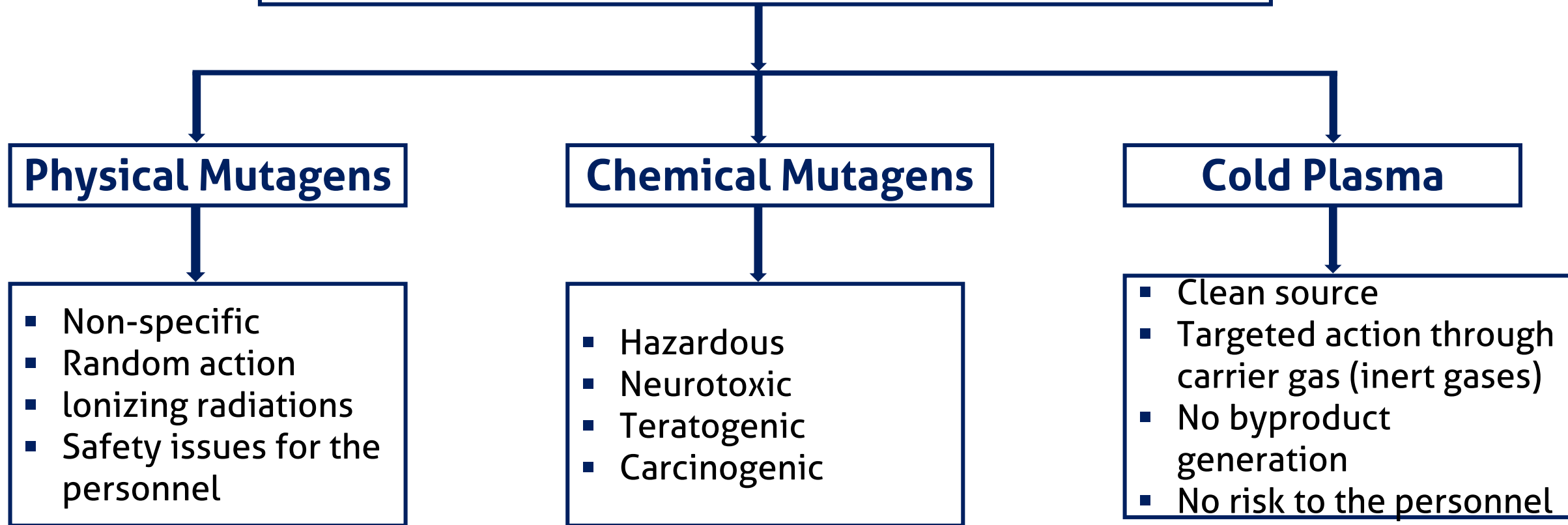
Bacterial



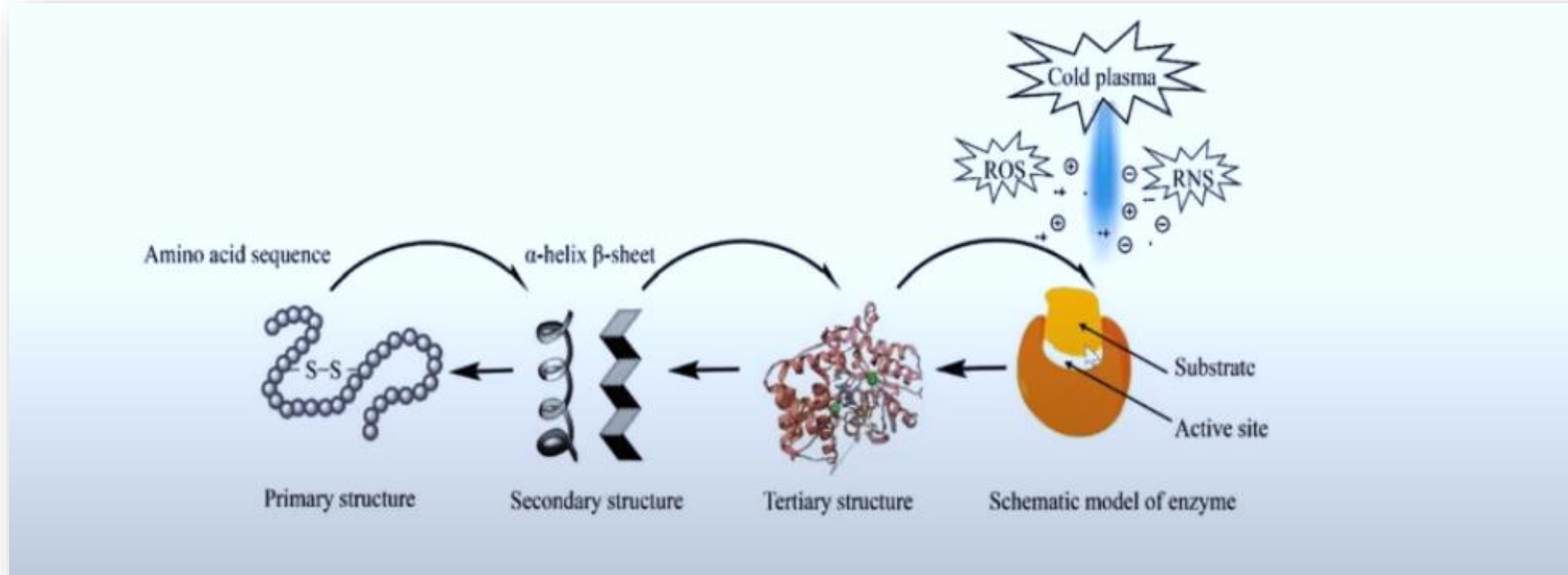
Microbial Inactivation: Fungal



Cold Plasma as a Green Mutagenic Agent



Enzyme Inactivation



Biological implications of plasma treatment

- Up regulation/down regulation of specific enzymes
- Induction of pathways associated with conversion of simple sugars during ethanol fermentation
- Plasma treatment can markedly reduce the lag phase
- Increase the specific growth rate of cells
- Shorten the exponential phase.



Effect of Cold Plasma on Microbial Fermentation

- Air cold plasma has been used as a novel method for enhancing microbial fermentation.
- Plasma agitation is shown to rapidly induce desirable phenotypic changes in *S. cerevisiae* after a single treatment, resulting in improved conversion of glucose to ethanol.
- With a complex environment rich in energetic electrons, highly- reactive chemical species, photons, and gas flow effects, plasma treatment simultaneously mimics exposure to multiple environmental stressors.
- Exposure of *S. cerevisiae* to air cold plasma could increase its cytoplasmic free Ca^{2+} concentration by improving the cell membrane potential, consequently leading to changes in ATP and NADH levels.
- A single treatment of up to 10 minutes performed using an atmospheric pressure plasma jet was sufficient to induce changes in cell membrane structure, and increased hexokinase 2 activity and secondary metabolite production.



Trusted Partner of following consultants...



Our Clients...

Serving Across Borders...





KEIRONE



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