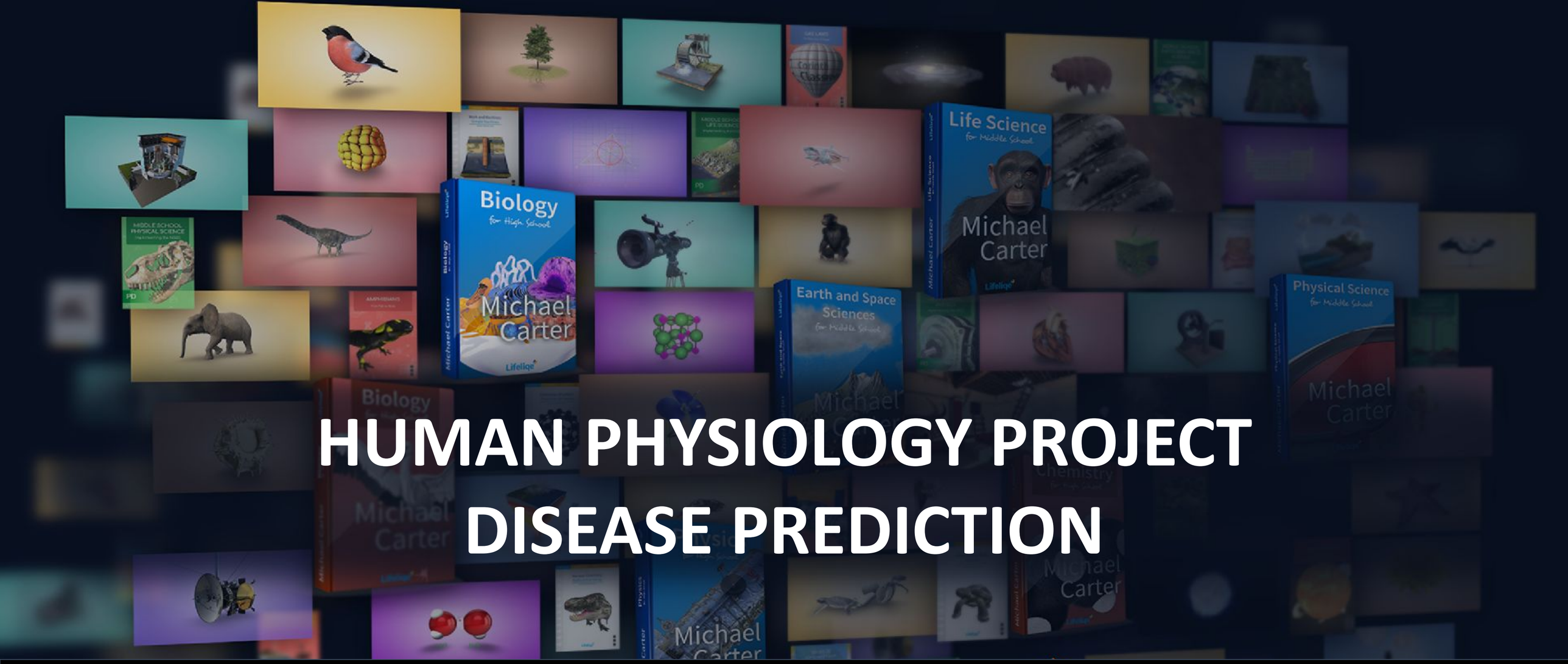

HUMAN PHYSIOLOGY PROJECT
DISEASE PREDICTION

GROUP 11 : KADABRA

TEAM MEMBERS

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PROJECT INTRODUCTION

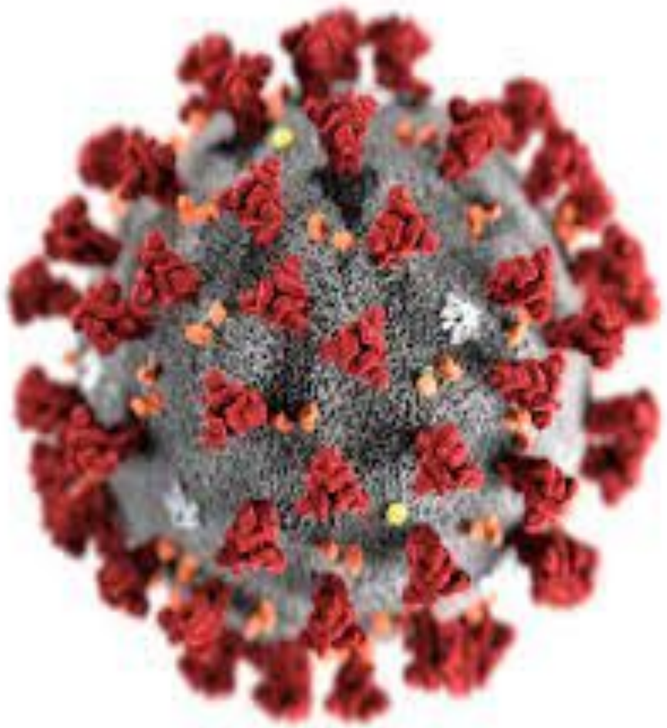
Disease Prediction System (DPS) is based on the Data Science And Aiml techniques which makes use of algorithms like Random Forest Classifier, Decision Tree algorithm and Tensorflow for predicting the risk level of diseases such as Breast Cancer, Covid-19 and Alzheimer Based on their symptoms and reports.

The Covid-19 prediction is based on 15 pathophysiological conditions that are used to predict the disease . The DPS predicts the likelihood of patients getting these diseases.

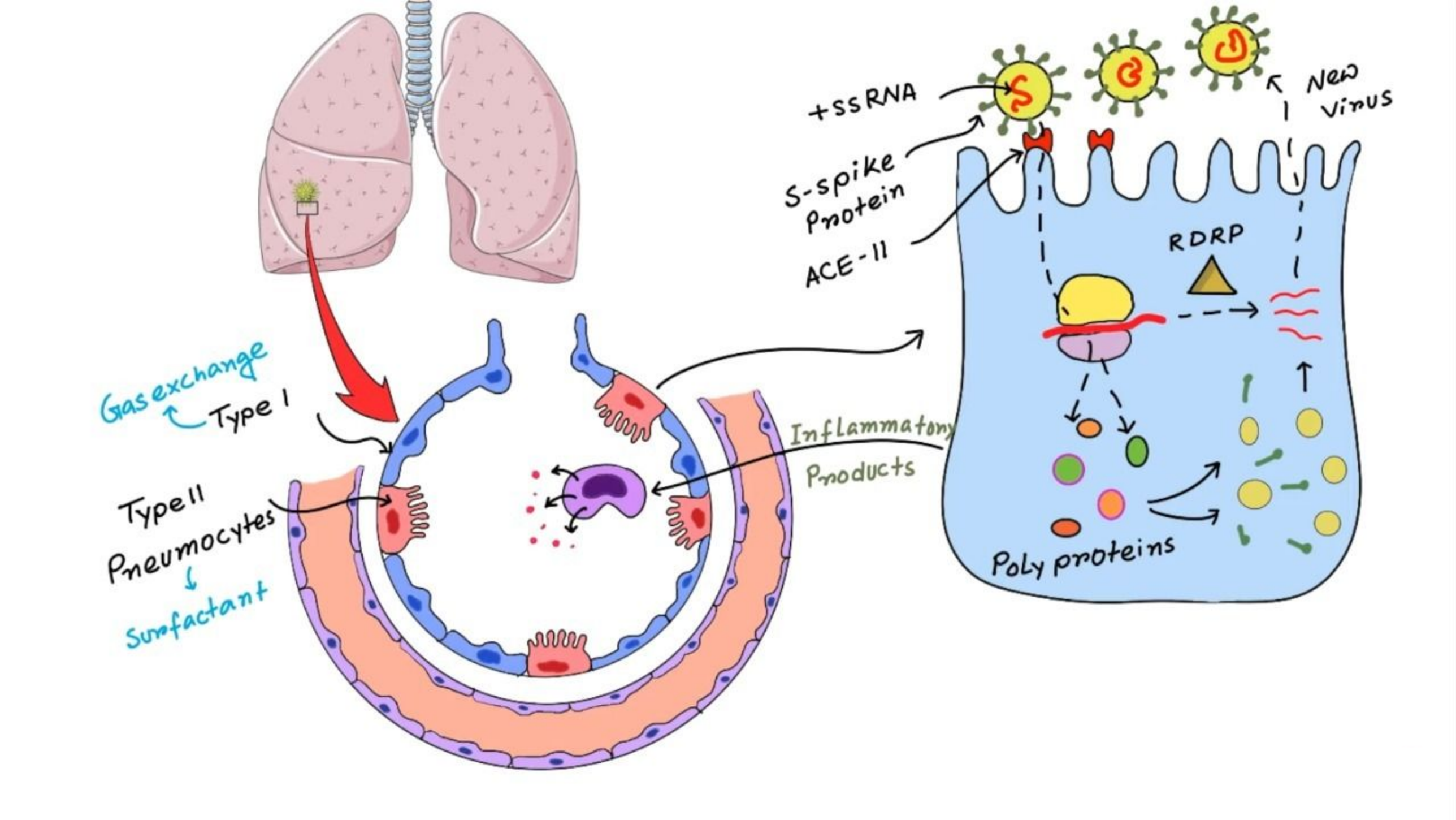
The breast cancer prediction is based on the features that are computed from the digitized image of breast mass.

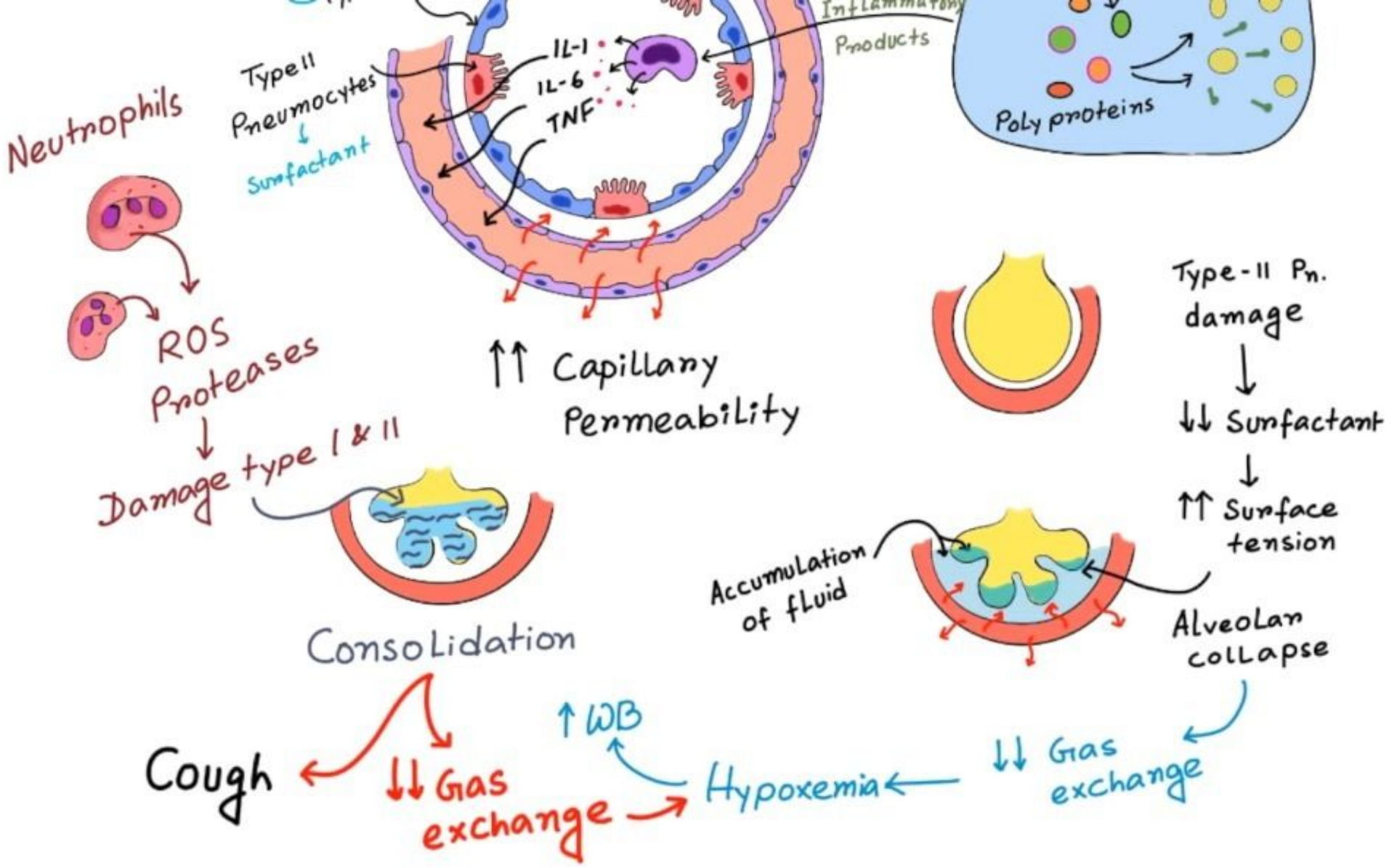
The Alzheimer’s disease prediction make use of the MRI scan of the human brain in order to predict the Dementia level of the patient.

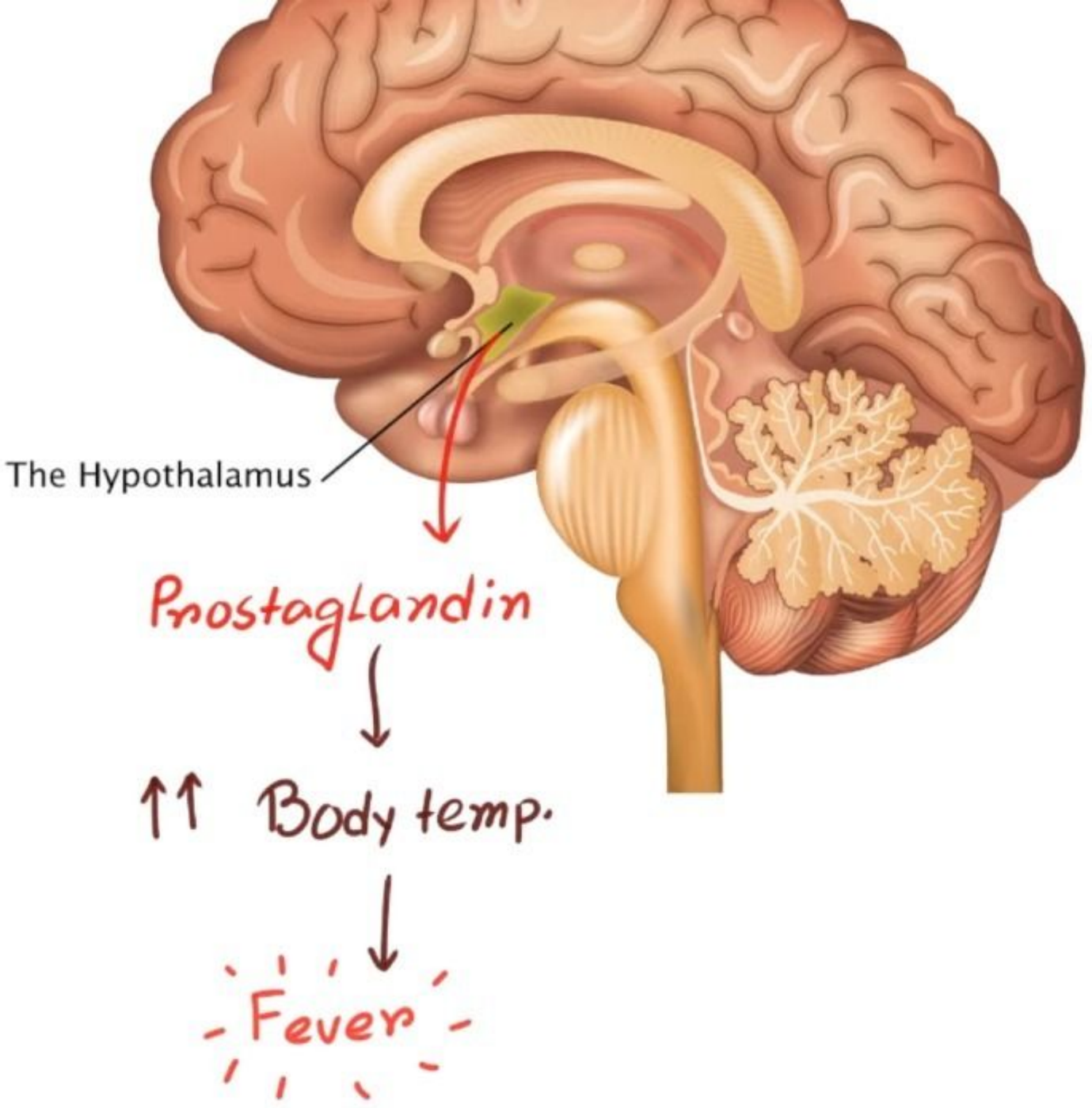
COVID-19 & its Pathophysiology

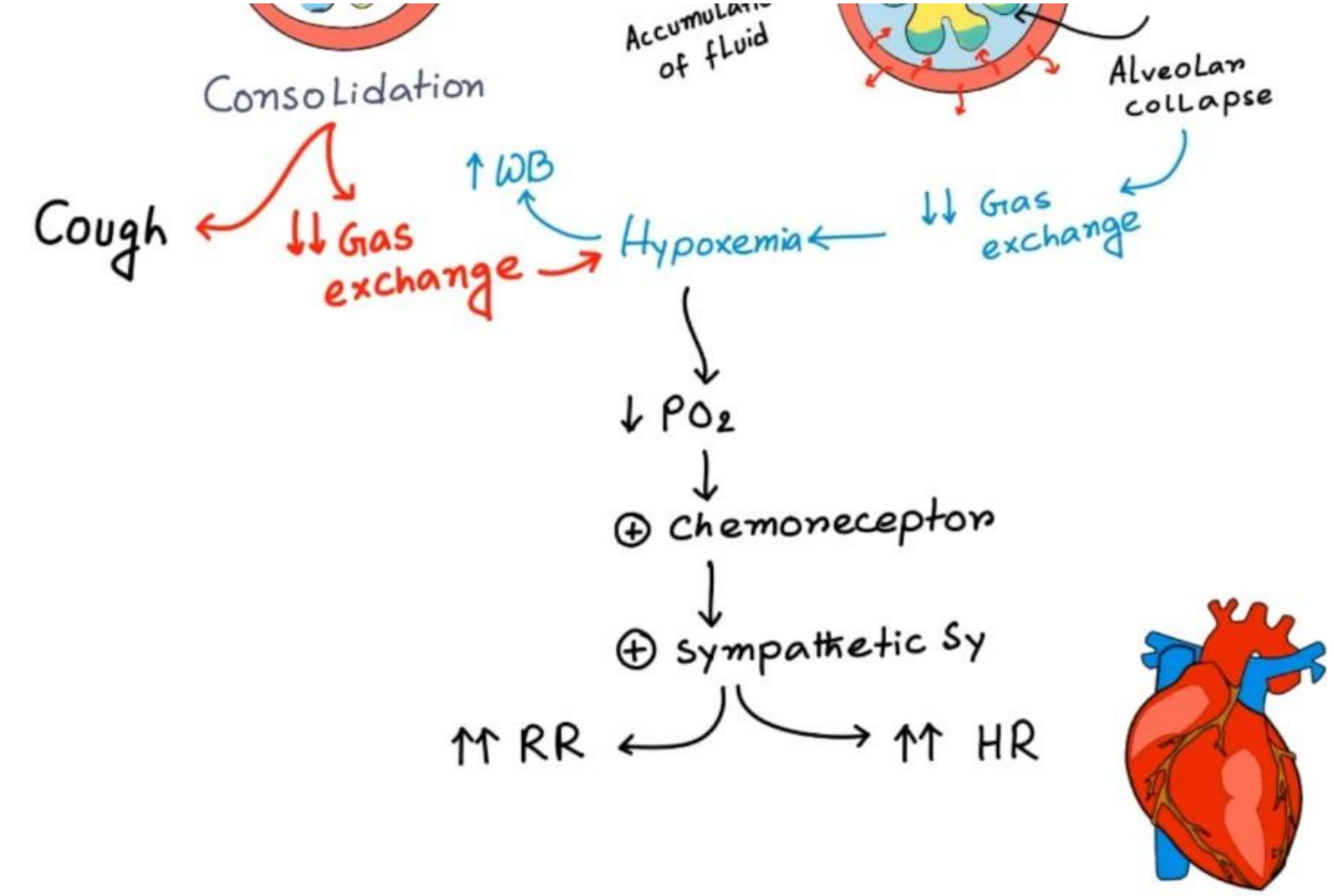


Human Physiology

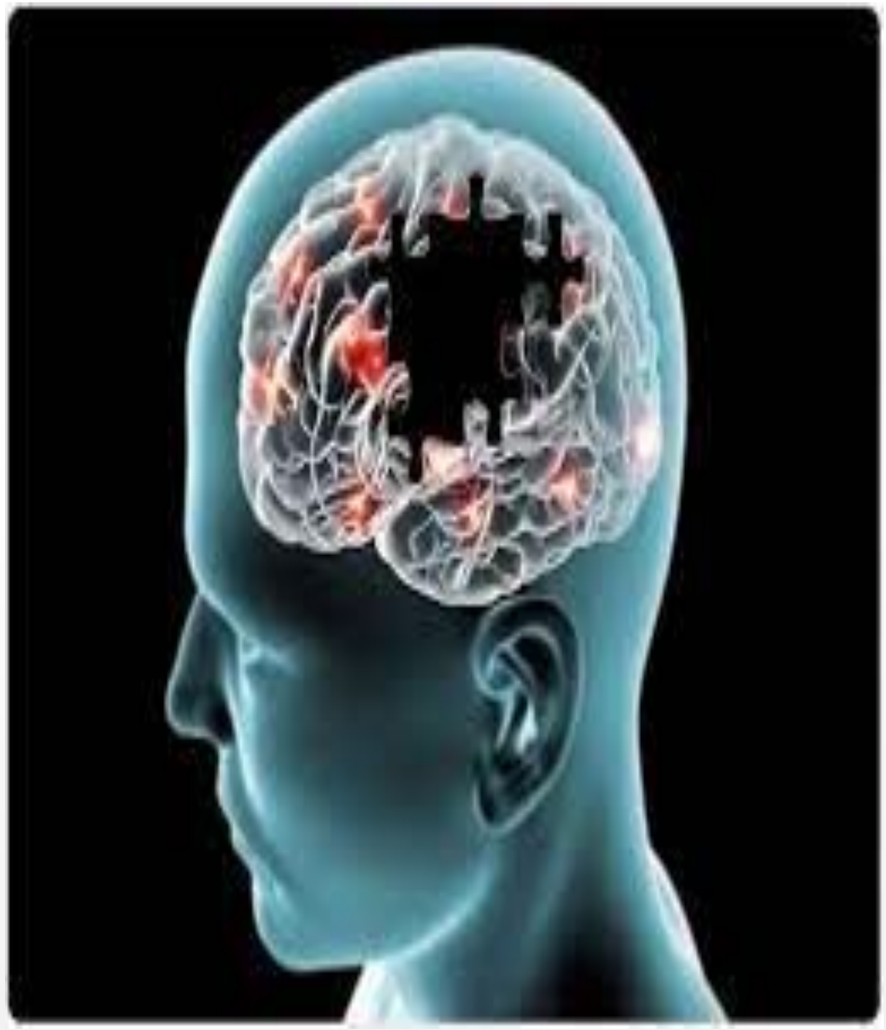

Gas exchange
Type I
Type II
Pneumocytes
Surfactant
+SSRNA
S-spike Protein
ACE-II
New Virus
RDRP
Inflammatory
Products
Poly proteins


Neutrophils
ROS
Proteases
Damage type I & II
Consolidation
Cough
↓↓ Gas exchange
↑WB
Hypoxemia
↓↓ Gas exchange
Alveolar collapse
Accumulation of fluid
↑↑ Surface tension
↓↓ Surfactant
Type-II Pn. damage
↑↑ Capillary Permeability
Type II Pneumocytes
↓
Surfactant
IL-1
IL-6
TNF
Inflammatory Products
Poly proteins


The Hypothalamus
Prostaglandin
↑↑ Body temp.
Fever


Consolidation
Accumulation of fluid
Alveolar collapse
Cough
↓↓ Gas exchange
↑WB
Hypoxemia
↓↓ Gas exchange
↓ PO_2
⊕ chemoreceptor
⊕ sympathetic Sy
↑↑ RR
↑↑ HR

Alzheimer & Its Pathophysiology



Human Physiology

Alzheimer’s Disease

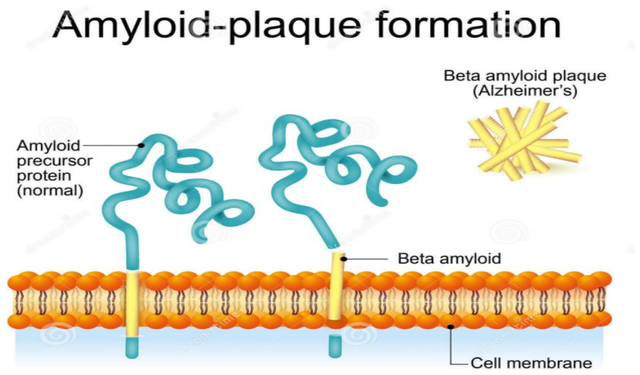
Alzheimer’s disease is a brain disorder that slowly destroys memory and thinking skills and eventually, the ability to carry out simplest tasks.

Note

Note: Alzheimer’s and Dementia is not the same. Dementia is a general term for decline in mental ability severe enough to interfere with daily life. Alzheimer’s is the most common cause of Dementia.

What causes Alzheimer’s?

- Plaques
- Tangles



Ways to test

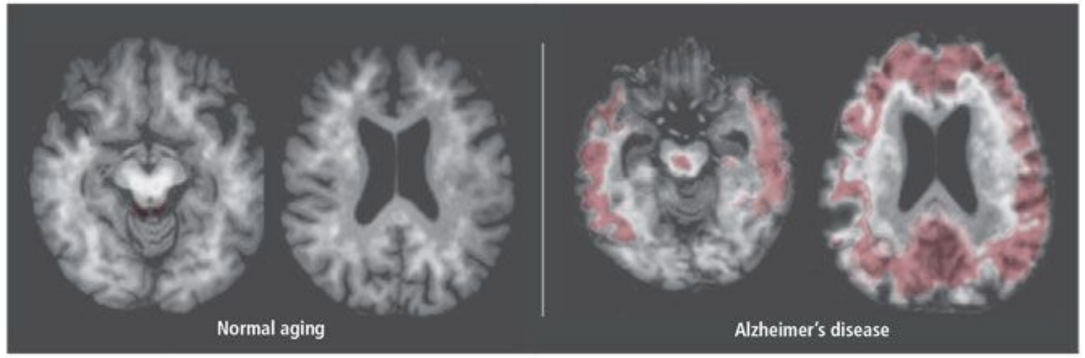
One way to test for Alzheimer’s disease is through brain scans. These tests can identify strokes, tumors, and other problems that can cause dementia. Scans also identify changes in the brain’s structure and function. The most common scans are:

- *Computer tomography (CT), which uses X-rays to produce images of the brain and other organs*
- *Magnetic resonance imaging (MRI), which uses magnetic fields and radio waves to, produce detailed images of body structures, including tissues, bones, organs and nerves.*
- *Positron emission tomography (PET), which uses radiation to provide pictures of brain activity.*

Identifying Alzheimer’s

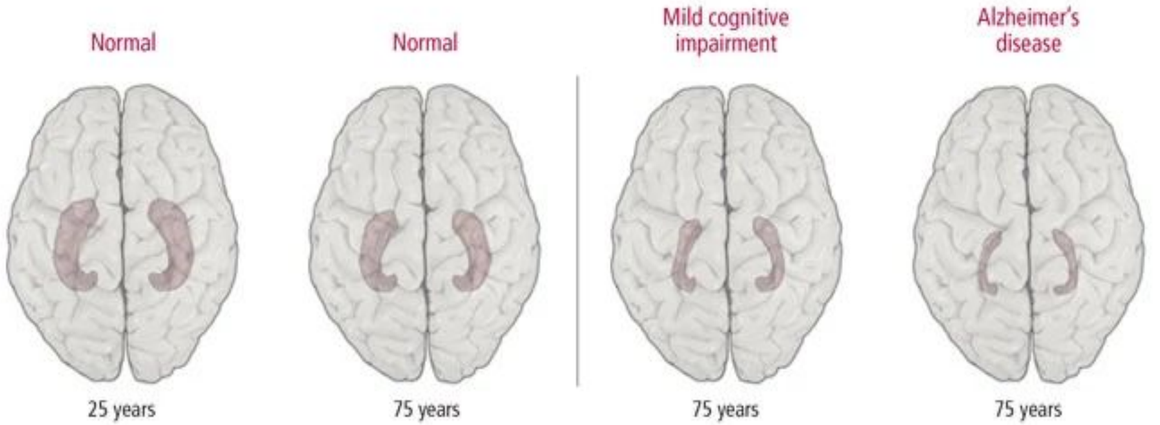
CT and MRI scans reveal the anatomic structure of the brain, which are then used to rule out such problems as tumor, hemorrhage, strokes, which can masquerade as Alzheimer's Disease. These scans also show the loss of brain mass associated with Alzheimer’s disease and other dementias. In Alzheimer’s disease, the region of the brain known as hippocampus may be disproportionately atrophied.

Figure 7 PiB scans to detect Alzheimer’s disease



A specialized form of positron emission tomography (PET) scan uses a chemical tracer called Pittsburg Compound B (PiB), which is injected into an arm vein before the scan. Once the compound enters the brain, it binds to amyloid deposits, the telltale sign of Alzheimer’s disease (shown in red in the brain on the right, from a person with the disease). Although researchers are optimistic the test may prove helpful for earlier diagnosis of Alzheimer’s disease, PiB scans are not yet commercially available. For more detailed, full-color versions of these images, see: www.health.harvard.edu/brain-imaging.

Figure 6 The shrinking hippocampus



A curved structure nestled deep within the brain, the hippocampus (from the Greek word for seahorse) plays a major role in forming, storing, and processing memories. The hippocampus becomes somewhat smaller as a part of normal aging, as shown by the comparison between the hippocampus in a healthy 25-year-old and a healthy 75-year-old. But the structure diminishes in size even more in a person with mild cognitive impairment and is markedly smaller than normal in a person with Alzheimer’s disease.

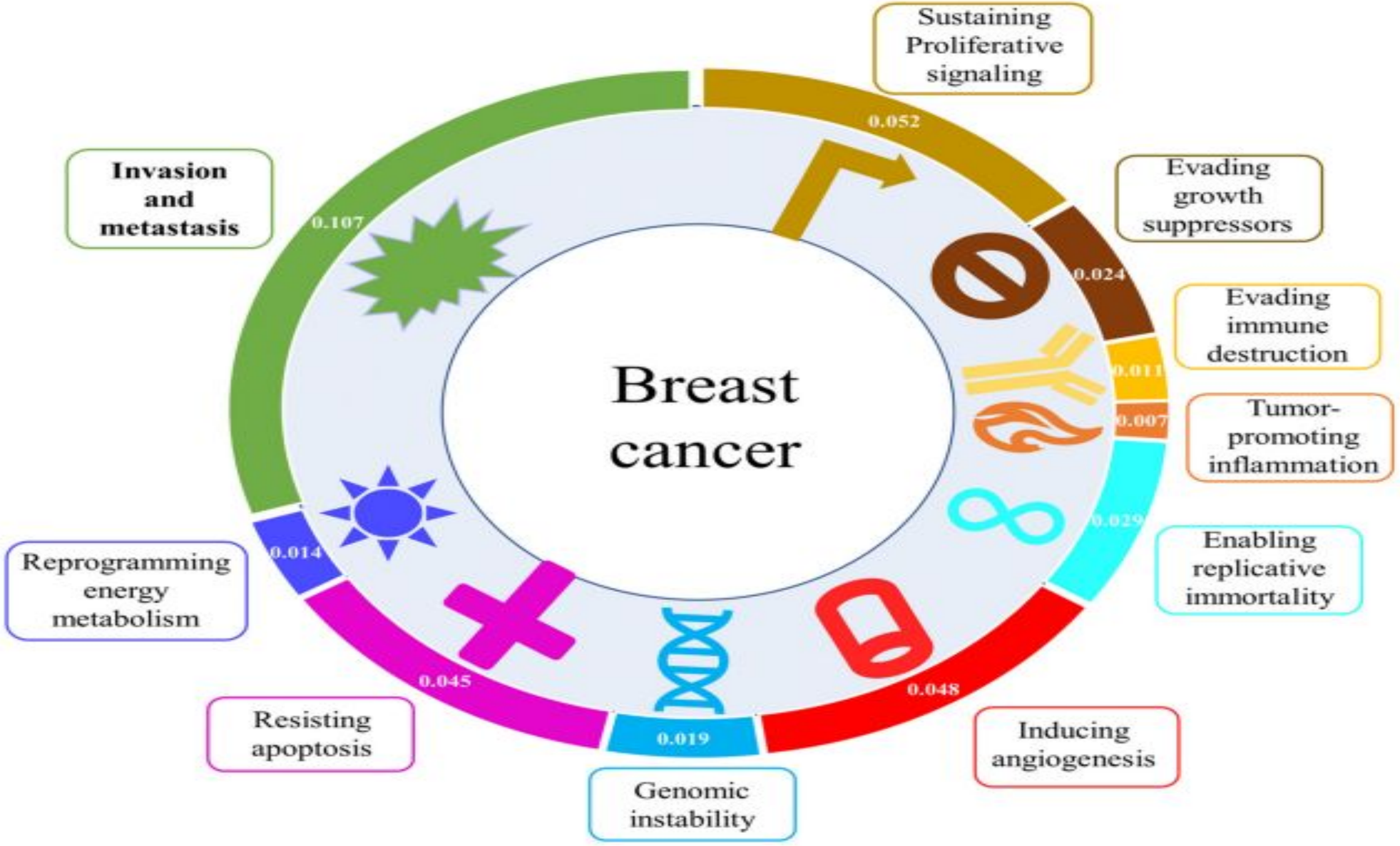
Researches also hope to perfect MRI techniques that can enhance physicians’ ability to measure brain atrophy and diagnose Alzheimer’s with greater accuracy.

Our project is going to use these MRI scans of the brain to identify the level of dementia in a patient.

Breast Cancer & Its Pathophysiology

Human Physiology

PATHOPHYSIOLOGY



Technologies And algorithms Used

Backend and Packages:

- **Python**
- **Streamlit**
- **Pandas**
- **Scikit Learn**
- **Tensorflow**

Functionalities and Algorithms:

Covid -19 prediction - Decision Tree Classifier

Breast Cancer Prediction - Random Forest Classifier

Alzheimer Prediction - Convolutional Neural Network

Thank You!

GROUP 11 : KADABRA