Acid of life 40" x70" Oil on Canvas

5 & 6

Life is Chemistry

of Bonds & Reactions and Sugars & Acids

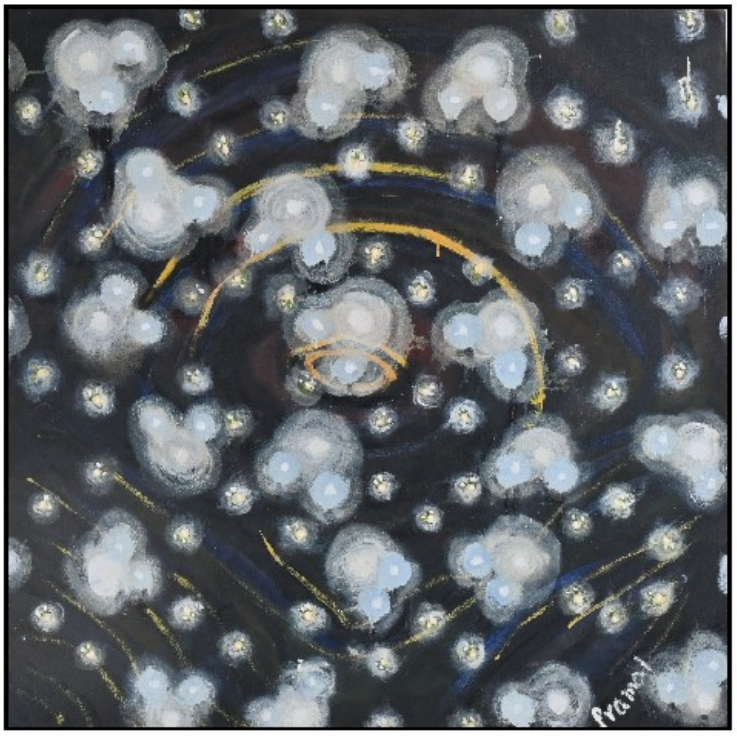
Paintings By Pramod Sahasrabuddhe

Venue: Gallery 4 Jehangir Art Gallery, Kala Ghoda Mumbai
From 8th April to 14th April 2024, between: 11 am to 7 pm

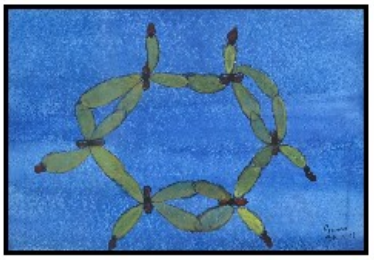
Elements

'We must trust to nothing but facts' Antoine Lavoisier. Father of Chemistry

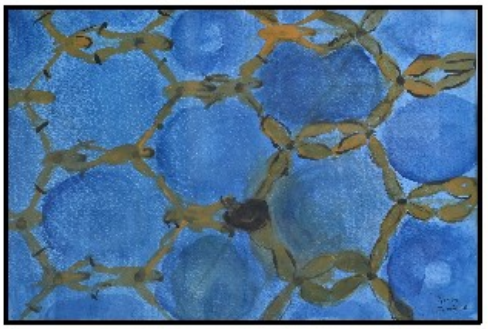
Carbon, Hydrogen, Oxygen, Nitrogen and Phosphorus are the basic building blocks of life.Carbon is essential and unique. It links with itself to form complex and visually pleasing chains. On its own, it forms hexagons but with nitrogen, it forms pentagons. Most of the life chemistry is either hexagons or pentagons.
My journey of this series began in 2008 when I painted benzene in watercolour. As I went through the journey, I found that Phosphorus is vital in DNA and cell membranes.



Ice 32" x32" Oil on Canvas



Benzene 16" x11" Water Colour on Paper



Graphite 21" x14" Water Colour on Paper

Phosphorous 36" x29" Oil on Canvas

Diamond 18" x24" Oil on Board

Isomers are molecules having the same formula but different structures. Each structure may have functionally different properties. The number of possible isomers can be several millions. It makes the life of a chemist challenging as well as interesting.
Life can not happen without hydrogen bonds. It has a unique property of disassociating and then recombining. Life depends upon duplication of itself. Hydrogen bond is key to that. Unlike ionic bonds or covalent bonds, there is no sharing just attraction.

Isomers 48" x36" Oil on Canvas

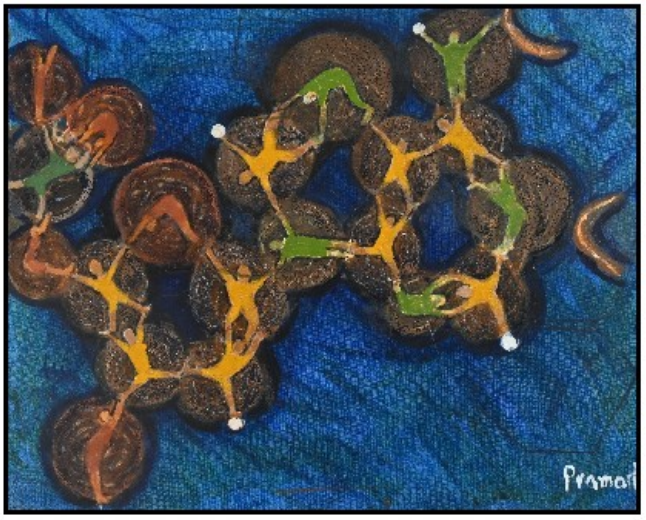
Hydrogen Bond 48" x36" Oil on Canvas

DNA Bases

Adenine, Cytosine, Guanine and Thymine form the basic building blocks of every DNA. Their permutations and combinations make each of us unique. There are 3.2 billion of them in each of our DNA.

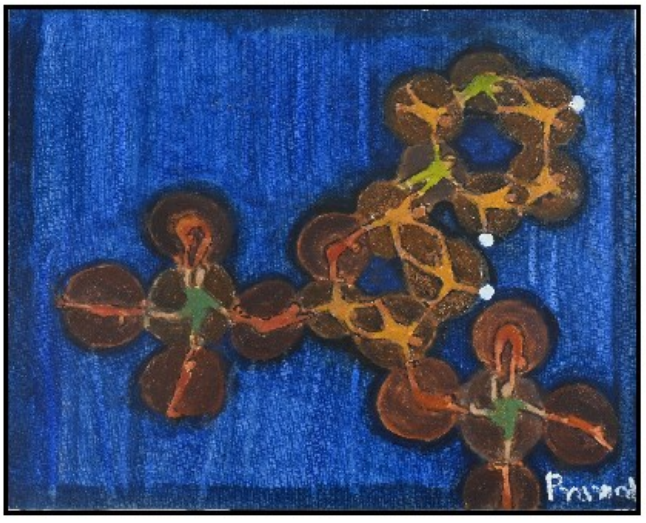
Base 1 30" x24" Oil on Canvas

Base 2 30" x24" Oil on Canvas



Base 3 30" x24" Oil on Canvas

Base 4 30" x24" Oil on Canvas



Base 5 30" x24" Oil on Canvas

DNA backbone strand is monotonous. It repeats itself. It is the longest polymer ever found. It has sugar in it and phosphate. The sugar is called deoxyribose. That is the D of DNA. The bases which connect the DNA strand happen due to the hydrogen bond. The geometrical figures in DNA are either hexagons or pentagons.

DNA strand 24" x30" Oil on Canvas

Connect 1 30" x24" Oil on Canvas

Connect 2 30" x24" Oil on Canvas

5&6 3 30" x24" Oil on Canvas

DNA 2 30" x24" Oil on Canvas

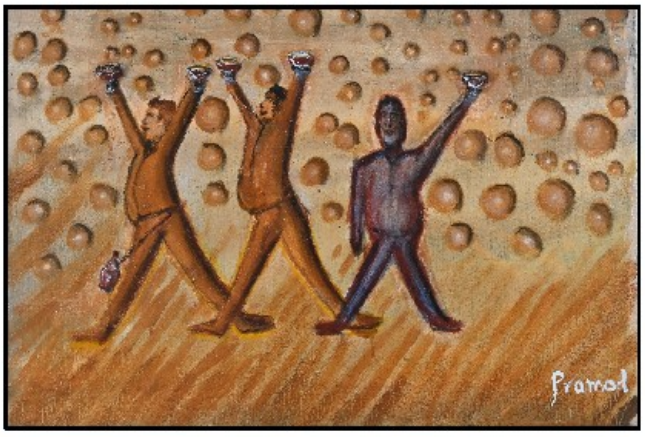
Energisers

Sugars, fats and alcohol are the three main energisers in our food. More of them make you less active. Of the three, fats are triglycerides, a kind of tripod. Sugars have exciting structures too. With many of them together they are called polysaccharides or carbs. These are like cotton fibres, one branches out from the other.

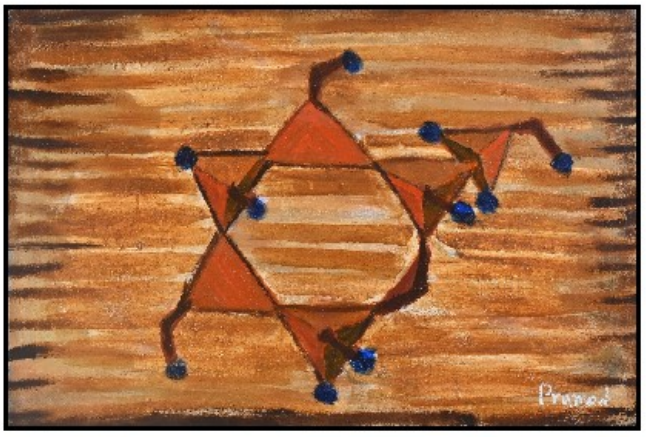
Carbs 24" x32" wire sculpture

Oil 30" x24" Oil on Canvas

Sucrose 30" x24" Oil on Canvas



Ethyl Alcohol 30" x20" Oil on Canvas



Glucose 30" x20" Oil on Canvas

Essentials

Proteins, Vitamins and Minerals are the three main essential ingredients of food. Proteins are made up of amino acids. About 50 to 2000 amino acids join together to form one protein. They have a very complex structure; one of the prominent ones among them is a spiral structure.

Protein 2 24"x32" wire sculpture

Amino Acids 30" x24" Oil on Canvas

Protein 1 30" x24" Oil on Canvas

B12 30" x24" Oil on Canvas

Manganese 30" x24" Oil on Canvas

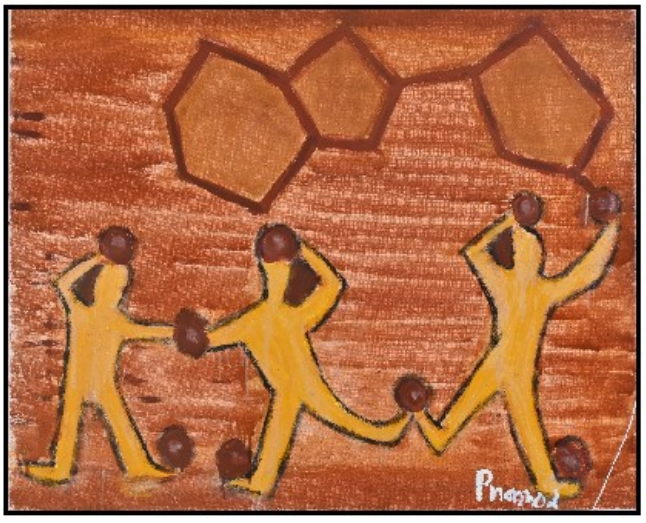
RNA is one of the most interesting molecules. It is like a vertical half of DNA. It gets synthesised and contains vital information from DNA. ATP is a key molecule which enables living bodies to put on work. Amongst other things it makes muscles to perform. Our heart is a pump that transfers blood. There are ionic pumps within a cell membrane which allows the two-way transfer of molecules.

RNA 24" x32" Wire Sculpture

Hemoglobin 30" x24" Oil on Canvas

Ferric Citrate 30"x24" Oil on Canvas

Ion Pumps 30" x24" Oil on Canvas



ATP 30" x24" Oil on Canvas

Reactions and Bonds

We eat complex molecules such as proteins, carbs and fats. The digestive process in the body separates amino acids from proteins. The body synthesizes its proteins afterwards. A complex tripod-type fat is converted to a single strand. In ionic bonds, the electrons flow out from one atom to another. The donor and donee then get paired up. In a covalent bond, electrons are shared between two atoms.

Bonds 24" x30" Oil on Canvas

Protein construction 30" x24" Oil on Canvas

Separating Amino Acids 30" x24" Oil on Canvas

Acid Base Reaction: 30" x 24" Oil on Canvas

Oil Digestion : 30" x 24" Oil on Canvas

Life grows or multiplies. In both cases, complex reactions happen. A molecule gets duplicated first. DNA has billions of atoms. The action of separation and regrouping attracted me.

One becomes two 48" x36" Oil on Canvas

5&6 48" x36" Oil on Canvas

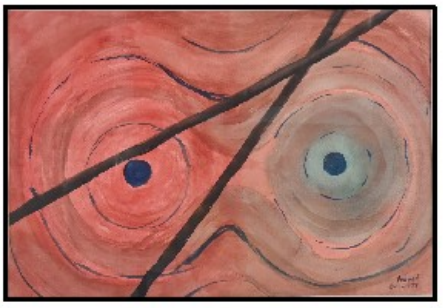
Miscellaneous

"The best way to have a good idea is to have a lot of ideas."
Linus Pauling

5&6 1 18" x24" Oil on Canvas

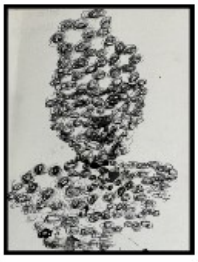
5&6 2 18" x24" Oil on Canvas

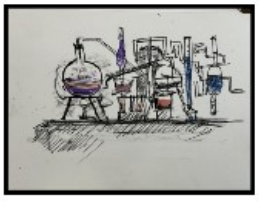
Carbs 2 16" x20" Oil on Canvas

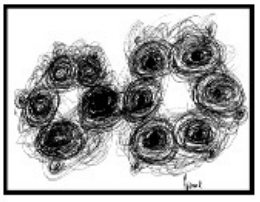


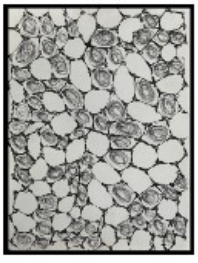
Ionic bond 19" x13" Water Colour on Paper

Some Sketches









About the Exhibition

As an artist, chemistry attracted me about 15 years back when I first painted benzene. I then read James Maxwell's famous book on the discovery of DNA. His simile of nature having pairs therefore DNA may have pairs appealed to me. Yet my knowledge level did not allow me to take liberty in combining chemistry and art. It helped me a lot to talk to several chemists and read and brush my college-level chemistry. As I painted and read, more clarity came. The exhibition is about this process of understanding.

Life is Chemistry: All the life processes are rooted in the reactions of some chemicals.

About 5 and 6
Benzene is a beautifully symmetric hexagon. Graphite is more beautiful with a continuous hexagonal structure. Painting graphite, I realised that the carbon atom is like a human with four limbs. I could see hexagonal structures within diamond and water crystals.

Then I came across pentagons with nitrogen. These are vitals and quite frequent.

About Acids and Sugars: DNA is both acid and sugar. Proteins are groups of amino acids. Fats are a kind of acid. All of the carbs we eat are sugars.

About Bonds and Reactions: Bonding is important in society. All of the chemistry is about bonds. In chemistry, reactions happen usually to break and make bonds, ditto in life.

About me

I am a 1959-born, graduate and postgraduate from IIT Mumbai in civil engineering.

As an artist, I have 4 solo exhibitions to my credit. I have participated in about 10 group shows. I have won one award. I have given talks and held workshops. I have held one all-India competition.

Being an engineer by training, I look towards science as an inspiration for my art. My other interests such as history and philosophy also get embedded in it.

I love oil paints and most of my paints are made by me.

As a structural engineer, I have designed several unique and iconic structures. I have also designed tall structures and long span structures. I also indulge in computer programming and several of my packages were in use in industry.

I am an activist of sorts and attempt to spread scientific temperament. I aim to spread art literacy in the society.

From Previous Exhibitions.

Contact Information:

Studio :
Pramod Sahasrabuddhe
Flat No. 1 D, Siddhivinayak Tower D
Near Runwal Nagar, Thane 400601

Email : pramod113@gmail.com
ph (+91) 98200 01848
https://pramodart.prasand.in