

# Omar Yaghi, Palestinian Nobel Laureate

*In 2025, the Nobel Prize for Chemistry went to Omar Yaghi, Susumu Kitagawa, and Richard Robson. This is the story of Omar Yaghi, who is a Palestinian American.*

Omar Yaghi's family was among the 7 lakh Palestinians who were forced to leave Palestine during the Naqba\* of 1948, and seek refuge in Jordan. Like most of the refugees, the Yaghis lived in a camp, where there was no electricity. As for water, it came just once a week and only for a few hours, so that the family had to scramble to fill every container they possessed.

Omar's father was a butcher. So, in addition to his 12-member family, he shared his home with the cattle he needed for his business.

Omar Yaghi was born in this camp-home in Amman (capital of Jordan) in February 1965.

The Nobel Laureate-to-be was not born in an educated family. His father had some basic education; his mother was illiterate. Yet, the parents knew the value of education, and sent their children to good schools. Unlike his siblings, Omar was a quiet child, not very interested in going outside to play. He was very observant though, and sitting quietly by himself he would observe a lot of things; and study.

There was a library in Omar's school. It was kept locked much of the time, for fear of rowdy children barging in and disturbing the peace of its dignified atmosphere. But Omar liked books, so one day during recess, when the rest of his class was out, he tried the handle of the library door, and to his delight, it flew open. It hadn't been locked at all! Ten-year-old Omar went in happily, picked up a book and settled down to read it.

The page he opened had a picture that fascinated him. He gazed at it. He learned that it was a picture of molecules, things he had never heard of before. Much later, Omar Yaghi said that the picture made him fall in love with molecules, because they were so beautiful.

Molecules figure in science subjects only: in physics, chemistry and biology. Omar became interested in chemistry. He loved molecules and tried to make beautiful designs with them.

This happened when Omar Yaghi was only ten years old.

In Amman Omar and his siblings often stopped at their father's shop on their way home from school. Their father cooked lunch for them and Omar would clean the shop and do other chores. In an interview after he had won the Nobel prize, he recalled that if he did not do the work well enough, his father would bid him do it again and again until it was the best he could do. This is how he learned work ethic, which was of great help to him later in his academic life.

When he was older, Omar's father told him to go to the United States, where he could get better higher education. Omar argued that he wanted

to stay in Amman, and complete his schooling as well as college there. But his father was insistent and gave him the family's small savings to pay for his initial expenses and education in the US. Accordingly, Omar left for New York. He was then fifteen years old, travelling alone to a country he had never visited before, and could not speak its language, i.e. English.

In New York state he first went to a community college, and then to the State University of New York where he completed his Bachelors of Science in chemistry. His next move was to the University of Illinois, where he did his Ph.D, and then a fellowship at Harvard.

Later he accepted a professorship at Berkely, and is still working there.

Omar Yaghi is the founder of reticular chemistry, which is a sub subject of chemistry. It is about creating metal-organic frameworks (MOFs) by stitching together metal nodes by means of organic linkers (connectors). Both, metal nodes and organic linkers consist of clusters of molecules.

### **Why are MOFs a very important invention?**

1. MOFs act like sponges by soaking up water, or various gasses from the atmosphere.
2. An MOF can soak up water even from the dry air of a desert, and make it available for use as pure drinking water.
3. It can help in reducing the dangers of climate change by lessening the excessive carbon dioxide in the atmosphere.

4. Many factories emit dangerous gases into the environment when they run (cement factories are among the worst offenders). MOFs can be very useful in getting rid of such poisonous gasses.
5. MOFs do not require electricity to start up or operate them.

The MOF is a new invention. It is very likely that more uses will be found for it as time goes on.

**Amina Azfar**

\*\*\*\*\*

***Naqba*** (Arabic) "the catastrophe" or "disaster", refers to the forced removal and deprivation of Palestinians during the war of 1948 between Arabs and Israelis. It shows the destruction of Palestinian society, of which 750,000 persons fled or were driven out of their homes.

***Molecule***: A molecule is the primary element of every substance. It forms when two or more atoms of the same or different substances stick together. When two or more atoms of the same substance stick together, they are written like this: O<sub>2</sub> (2 atoms of oxygen); if it is made of two or more atoms of different substances, it is written like this: H<sub>2</sub>O. (Two atoms of hydrogen, and one of oxygen.). H<sub>2</sub>O is a molecule of water.

***Organic*** (carbon-based) molecules contain carbon atoms, which are almost always combined with hydrogen atoms. *They are produced by living organisms.* Sugar is an organic compound because it is made from a living organism (plant: sugar cane or sugar beets).

***Inorganic*** molecules *are not produced by living organisms.* They do not combine carbon-hydrogen atoms. Most salts are inorganic compounds because they do not have carbon-hydrogen bonds and are not produced by living organisms. (Inorganic molecules come from non-living material, like minerals or metals). The common table salt is an inorganic, mineral-based salt. Diamonds are inorganic (they do not come from a living source, like plant or animals).

\*\*\*\*\*