

Biomaterials

1 Complete the passage with the words in the box.

deals with • dissolve • figuring out • fit into • heals • implanted • integrate • interact • management • man-made • mean • paired • poison • rate • stents • whole

Biological materials are materials that (1) with biological systems. These can include:

- **biocompatible** materials, which are designed to be chemically neutral in the body; in other words, these materials are (2) in the body for some primary purpose, often structural and need additional engineering to make sure they do not (3) you;
- **bioactive** materials, which *do* (4) with the body, but in a positive way;
- **biodegradable** materials are designed to (5) in your body; they can provide structural support while your body (6) and dissolve harmlessly at a rate similar to the (7) your body heals;
- **biomimetic** materials are materials which are nature-inspired. Biomimetic materials science is (8) the reasons for excellent properties in naturally-occurring materials and reproducing them in (9) materials.

There are also “biological” materials that do not really (10) these categories. For example, (11) are made of a shape memory alloy (which is definitely a functional material) but must also be biocompatible.

Energy materials are often (12) with environment materials because it’s easier to secure funding that way. Energy materials mostly mean batteries, but it can also mean any material designed for some energy production application. This could mean for the petroleum industry.

In addition to materials for battery technology (which includes conductors, insulators, energy storage, and even thermal (13)), energy materials can also (14) materials for nuclear reactors (structural, thermal, radiation-resistant), hydro-power generators, wind turbines, solar cells, and especially experimental energy-production methods.

There is a (15) sub-field of materials science that (16) bio-materials, but biomedical engineers prefer to think of that as a subfield of their own discipline.

Materials science, chemistry and chemical engineering all work with fluids. For materials science, the fluid is usually used for an intermediate processing step.

(Adapted from <https://mstudent.com/what-is-materials-science-and-engineering-the-definitive-explanation/>)