

BIOMIMETICS

the 30-second architecture

3-SECOND FOUNDATION
Biomimetics is the study, distillation and development of the structure, form, formation, or structure of biological systems and materials as models for design.

3-MINUTE ELEVATION
The term 'biomimetics' is rooted in the Greek words for 'life' and 'imitation'. It was first coined in the 1950s by American biophysicist and polymath Otto Schmitt, and it is often used synonymously with biomimicry, biomimesis, and bionics. Besides the most famous example of biomimetics, Velcro (in imitation of the burrs of the burdock plant), is the recent and award-winning kinetic facade of the Al Bahar Towers by Aedas (2012) in Abu Dhabi.

From Native American teepees, Egyptian lotus, papyrus, or palm columns, to Greek Corinthian ornamentation, architecture has always looked to nature for inspiration. Beyond the zoomorphic and phytomorphic formal imitation of organic architecture, biomimetics looks closely at how evolutionary processes have optimized living organisms over billions of years to adapt efficiently to their environments. It evaluates manufacturing, organizational, and mechanism strategies on various levels (organism, behavior, ecosystem), and thus is seen as one of the most promising emerging principles in sustainable twenty-first century design. Since the nineteenth century, among the most notable architects inspired by nature are Alvar Aalto, Santiago Calatrava, Buckminster Fuller, Antoni Gaudi, Bruce Goff, Hugo Häring, Imre Makovecz, Frei Paul Otto, Eero Saarinen, Rudolf Steiner and Frank Lloyd Wright. In recent decades, starting with Janine M. Benyus (*Biomimicry: Innovation Inspired by Nature*, 1997) then Steven Vogel and Julian Vincent in the 2000s – but due mostly to the advances of computation and digital fabrication – biomimetic principles are being simulated *in silico* with increasing precision, pushing the boundaries of computational form generation, material engineering and environmental performance.

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3-SECOND BIOGRAPHIES

FREI PAUL OTTO

1925–2015

German architect, engineer and authority on biomimetic lightweight structures

JOHN FRAZER

1945–

British architect and CAD pioneer

30-SECOND TEXT

Marjan Colletti

Like a protective skin, fibreglass mesh parasols on the facade of the Al Bahar Towers open and close in response to the movement of the sun, reducing heat and glare.

