



The Human Body's Extraordinary Engineering

Pumps, pipes, sensors and feedback loops that never shut down

The numbers

100,000

heartbeats a day

~2,000

gallons pumped a day

60,000

miles of blood vessels

98.6°F

held steady by
feedback

Red blood cells live about 120 days, and your body makes millions every second.

An engineer's view

Body system	Engineering match
Heart and blood vessels	Pump and piping network
Lungs	Gas exchanger
Kidneys	Filtration plant
Nerves	Wiring and signals
Immune system	Security and threat detection

Each system is controlled and monitored around the clock.

A feedback loop: body temperature

1

Sensors detect a change

Skin and brain notice you're too hot

2

The controller decides

The hypothalamus compares to the set point

3

Actuators respond

Sweating and wider blood vessels release heat

4

Back to normal

The response eases off as you cool

Homeostasis

Keeping conditions steady inside the body, just like a thermostat.

Sources: National Institutes of Health; American Heart Association

Remember

Your body runs on feedback control: sense, compare, correct, every second of your life.