How Biotech and Data Science can be used to Evaluate Cleantech in Buildings and Cities
Healthy & Energy Efficient Buildings

How Biotech and Data Science can be used to Evaluate Cleantech in Buildings and Cities

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we were wrong
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Microbes can’t be visually differentiated
Less than ~1% of microbial life can be grown in a petri dish.
design healthy buildings
Energy Use

Mechanically Ventilated

Naturally Ventilated

Mechanical Supply Office
Corridor
Window Supply Office

More similar to human microbiomes

Kembel et al. PLOS ONE 2014

More similar to soil/water microbiomes
Ventilation design impacts the indoor microbiome

Sources of Air in Offices
- Mechanical
- Open Window
- Outdoor

Kemmel et al. ISME 2014
Sources of Air in Offices

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Kembel et al. *ISME 2014*
Rather than asking …

How can we keep microbes out of the indoor environment?

Ask instead…

How can we operate current buildings and design future ones to promote beneficial microbes, inhibit harmful microbes, AND avoid energy waste?
the future is now
“I believe in the power of research and innovation to make a difference in people’s lives by improving human health, strengthening the economy, and addressing the grand challenges that society faces.”
1 in every 25 hospitalized patients gets an infection

ARCHITECTS POLLUTE

An alarming new analysis of global warming says architects are the problem—and our best solution.
optimize health

+ balance energy
energy 

health
+
energy

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