Zylar Vespera
Name: Zylar Vespera, PhD
Title: Bio-Architect & Urban Futurist
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Location: London, UK

Professional Summary

Bio-architect and scientist specializing in bio-integrated, carbon-negative building systems. Combines 12+ years of academic research with practical high-rise and district-scale design experience. Focused on regenerative urbanism—designing built environments that leave ecosystems and communities better than they were found.

Key themes:

- Bio-material integration (mycelium, timber, bio-composites)
- Carbon-negative and energy-self-sufficient buildings
- Vertical forests and biodiverse urban micro-climates
- Adaptive, data-driven urban density inspired by natural systems

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Professional Experience

Founder & Principal Architect – Vespera Labs (London)

2018 – Present

- Lead a multidisciplinary team of ~40 architects, botanists, and coders focused on “living buildings” and regenerative urban design.
- Secured **$20M in Series A** funding for material research into bio-composites and self-healing structural systems.
- Directed design and delivery of carbon-negative and low-embodied-carbon prototypes, including district-scale housing concepts using **CLT + mycelium** structures and waste-to-heat energy loops.
- Advised municipalities and developers on masterplanning strategies to reduce urban heat-island effects, improve walkability, and integrate ecosystem services (shade, water, biodiversity) into dense urban fabrics.

Senior Design Associate – Bjarke Ingels Group (BIG), Copenhagen

2014 – 2018

- Lead designer on the **“Spiral Tower”** concept, a high-rise with helical terraces and integrated green space.
- Specialized in algorithmic façade optimization to balance daylight, thermal comfort, structural efficiency, and material usage.
- Collaborated with engineers and computational designers to prototype adaptive façades and kinetic shading systems.

Selected Projects & Case Studies

Oslo Project Alpha – "The Lung of Norway" – Oslo, Norway

Mixed-use housing district on reclaimed industrial dockland

- Designed a honeycomb-like housing complex built from **Cross-Laminated Timber (CLT)** and **mycelium-based components**.
- Applied **phytoremediation** with hyper-accumulator plants to treat toxic soils in situ, avoiding carbon-intensive soil removal.
- Implemented a district-wide **waste-to-heat energy system** powered by residents' organic waste.
- Outcomes:
    - **Carbon Negative**: project sequesters more carbon than emitted during construction.
    - **Energy Bills**: residents pay ~**60% less** than Oslo average due to passive heating and smart energy loops.
    - **Schedule**: delivered **4 months ahead** of schedule through modular timber assembly.
    - **Recognition**: awarded the *European Green Design Star 2024*.

Eco-City Masterplanning – Singapore, UK, Norway

(Portfolio of 3 eco-districts / eco-cities)

- Contributed to the design of three eco-city projects across Singapore, the UK, and Norway, focusing on:
    - **15-minute city** principles (all essentials within a short walk/bike ride).
    - Vertical forest planning to improve micro-climate, air quality, and biodiversity.
    - Transit-oriented development and reduced private-car dependence.

Education

PhD in Bio-Mimetic Engineering

ETH Zurich, Switzerland – 2014

- Thesis: *"Structural Integrity of Fungal Composites in Seismic Zones."*
- Research focused on mechanical behavior, durability, and safety factors for mycelium-based structural materials.

Master of Architecture (M.Arch)

The Bartlett School of Architecture, UCL – 2010

- Graduated with **Distinction**.
- Specialized in experimental structures, computational design, and urban futures.

Speaking Engagements & Thought Leadership

- **TED Global 2023** – *"Why our houses should grow"*
  Explored how bio-materials and living systems can replace extractive construction practices.
- **COP29 Keynote** – *"Decarbonizing the Concrete Jungle"*
  Addressed pathways to carbon-negative building stock and regenerative urban planning.
- Featured in: *Wired*, *Architectural Digest*, and the *Davos World Economic Forum* (as per your KB, if present).

Core Expertise

- **Bio-Material Integration** – Mycelium composites, CLT, bio-based insulation and finishes.
- **Carbon-Negative Design** – Strategies to sequester carbon in structure, envelope, and landscape.
- **Vertical Forest & Green Infrastructure** – High-density planting on buildings, green roofs, and facades.
- **Urban Regeneration** – Converting post-industrial and underused districts into resilient mixed-use ecosystems.
- **Computational Design** – Algorithmic massing, façade optimization, and performance-driven masterplans.

Collaboration & Roles

- Works with: municipalities, developers, research labs, and cross-disciplinary teams (engineers, ecologists, material scientists).
- Open to: advisory roles, design leadership, speaking, and research partnerships in regenerative urbanism and bio-architecture.