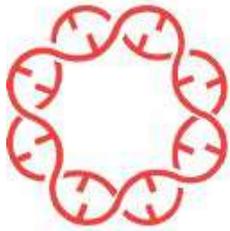




# Mitra Bio



# MITRA BIO

## Company Profile

Mitra Bio, founded in 2020, is developing a platform that provides actionable insights into the skin's genetics and epigenetics with the goal of powering skin longevity.

Mitra Bio has non-invasive skin sampling technique together with unique epigenetic biomarkers to track skin aging directly on human volunteers (not on skin models or animals as it is today)

The biomarkers identify the impact of rejuvenation therapies on skin's own cellular aging. This powers the development of skin rejuvenation compounds that target the root cause of aging not just the symptoms (wrinkles)

We are transforming skincare by approaching aging as a disease to be fought – Mitra Bio

Mitra Bio was created by Dr Shakiba Kaveh and Dr Cristiana Banila. Dr Shakiba Kaveh worked at a large skincare company where she first saw the efforts being made to create personalised skincare by extracting insights from individual skin. She has a PhD in Materials Science from Cambridge University. Dr Cristiana Banila studied Biochemistry at Oxford and Princeton. As part of her PhD, she developed a non-invasive molecular tool to replace pap-smears based on epigenetics biomarkers, a tool currently in trial by the NHS. Combining Dr Shakiba Kaveh's experience in the skincare industry and Dr Cristina Banila's knowledge of developing diagnostic tools, Mitra Bio was founded. Bringing together domain insight from skincare and the epigenetics know-how to disrupt the market, Mitra Bio's aim was to build a tool that skincare companies can use to develop efficient and effective antiaging skincare products.



The global antiaging market is estimated to be worth \$49.93 billion in 2022 (“Anti-Aging Global Market Report 2022”, 2022) while the global skincare products market was worth \$148 billion in 2020 with a projected growth reaching \$189 billion by 2026 (“Global Skin Care Products Market Report and Forecast 2022-2027”, 2022) . These trends demonstrate a clear interest and growth trajectory for both markets. Nonetheless, at present skincare and antiaging products simply target the signs of aging without targeting the root cause at a cellular level. This is largely due to the lack of comprehensive understanding of what causes cellular aging of the skin, a lack of ways of qualifying skin aging and lack of non-invasive skin sampling techniques which have limited research in this area. There is also lack of data from multiple skin ethnicities and how different skin tones react to the environment. Most clinical trials are performed on white skin. Mitra Bio hopes to overcome some of these obstacles by developing non-invasive skin sampling tools that provide insight into skin aging inclusive of all skin types and can facilitate the development of real effective skincare products that target skin aging at cellular level.

Skin has been disregarded in many longevity studies. The goal of Mitra Bio is to fight skin aging like a disease and power personalised rejuvenation solutions for the individual skin types. By using multi-omics with a focus on epigenetics biomarkers, Mitra Bio can gain the necessary insights to understand skin aging and understand its interaction with lifestyle choices, the environment and topical/edible supplements. The combination of non-invasive sampling technology and proprietary biomarkers gives Mitra Bio a quick way to gauge the effectiveness of antiaging compounds. This reduces the time to market of compounds as it could take years with currently available tools.

On top of that, Mitra Bio’s biomarker database will drive a revolution in the discovery of new effective antiaging compounds. By using the platform researchers will turn genetic and epigenetic biomarker data derived from skin-patches, into actionable insights for progress. By deeply understanding aging, Mitra Bio’s partners will be able to develop the next generation of skincare products that target the root causes of aging, not just the wrinkles.

Furthermore, Mitra Bio is adamant in that the use of in vitro skin models or animal models are not enough in the discovery of antiaging compounds. Instead, Mitra Bio approach is to use of non-invasive skin sampling methods to extract epigenetics biomarkers from volunteer’s skin at scale. Through on-going clinical trials with different skincare companies, Mitra Bio can build a proprietary database of biomarkers encompassing all skin types. This enables Mitra to guide the design of new compounds using in vivo insights from the human skin and its interaction with the environment without having to rely on the more unreliable insights provided by in vitro studies and animal models.



# Flagship Product Deep Dive: Mitra Bio

## Mitra Bio

Blood or saliva samples will never give accurate indications of skin health, and this is one of the reasons why Mitra Bio wanted to use a different approach. Mitra Bio is the only company that uses non-invasive skin sampling to read skin's biological age, UV damage and other skin health metrics based on epigenetic signatures.

As an Illumina's portfolio start-up, Mitra Bio had access to state-of-the-art laboratory facilities that enabled Mitra Bio to optimise sample collection and to perform deep sequencing on over 300 skin samples. Mitra Bio performed whole genome sequencing, reading all 28 million CpG sites compared with only 850,000 CpG sites which is the industry's norm, and this led to the identification of unique biomarkers specific to skin types, skin age, effects of menopause and UV exposure.

Now, Mitra Bio has proprietary biomarkers which can quantify healthy skin and predict accelerated aging of skin based on the interactions with the environment. This enables the company to identify efficacious compounds that can make molecular improvements in the skin during in vivo trials. All without the need of taking a skin biopsy as Mitra Bio can take samples from human skin painlessly, quickly and cheaply.

Mitra Bio is involved in strategic clinical trials to understand the effects of the environment on the skin.

## Evidence of safety and efficacy

Mitra Bio is conducting clinical trials in collaboration with skincare companies that are at the forefront of developing longevity skincare. The outcome will be published in the near future.

# Target market

## Skincare Consumers

Skincare consumers are leaning towards science-backed and ingredient-led skincare products. In a recent report published by Deloitte, skincare efficacy was ranked the top factor driving skincare purchases above even sales promotions.

The future of skincare is gearing towards a medicinal approach where a skin diagnosis can inform a more efficacious solution for the individual skin. It is forecasted that this approach will double the size of skincare market to \$400 billion. This is only enabled by getting real data from the skin.



## Channels to market

Mitra Bio is working with the top skincare brands and manufacturers via B2B research collaboration. Mitra Bio will also be launching their B2C membership in 2023.

## Success Factors

## Team and Reputation

### Founders:

Mitra Bio is a great example of founder-led biotech movement. The founders come from complementary backgrounds.

**Shakiba Kaveh (CEO)** worked at a skincare company, having witnessed first-hand the importance of data-driven approach for skincare development. Shakiba worked 5 years as a management consultant advising companies on their operations and route to profitability.

**Cristiana Banila (CSO)** is an epigenetics scientist who developed non-invasive diagnostics test for early cancer detection. Cristiana understands exactly how to power clinical trial claims with data. The founders are applying the latest development in the epigenetics field to power development of longevity skincare products to disrupt the skincare market. This is enabled by their data-driven approach to inform performance of actives in the skin rejuvenation.





## Key scientific advisors:

Advisors include professionals who had top position at leading skincare companies, established academics experienced in machine learning as well as dermatologists who are keen to innovate the industry.

## Unique Approach

Mitra Bio is the first and only company to have a skin-based epigenetics testing to infer biological aging and other age-related biomarkers. The aging clocks built using saliva or blood cannot inform of molecular changes that specifically happen in skin. Epigenetics is tissue specific and cannot be inferred using other tissues. Mitra Bio is analysing epigenetics by bypassing the use of invasive biopsies.

## Funding

The company has raised a total of £1.1M from private and non-dilutive funding. Notable investors include Illumina, Entrepreneur First, First-in Ventures, Innovate UK Biomedical Catalyst as well as private angels. Mitra was also part of the Oxford University accelerator (Oxford Foundry)