

AI-Driven Molecular Skin Analysis & Personalized Skincare

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VU Ref. Number: VU21042

ADDRESSED NEED

Consumers struggle to select appropriate skincare products from countless options that may not address their specific skin needs. Traditional methods of skin assessment lack precision and fail to account for skin differences on the molecular level that significantly impact product efficacy. To overcome these challenges, this innovative platform combines advanced skin analysis through mass spectrometry with a sophisticated AI recommendation engine. Unlike conventional skin assessments that rely on visual inspection or basic questionnaires, this technology characterizes skin at the molecular level to generate truly personalized product recommendations. The system provides users with accessible yet scientifically robust information about their skin characteristics and matches them with products that contain ingredients best suited to their specific skin composition.

KEY BENEFITS

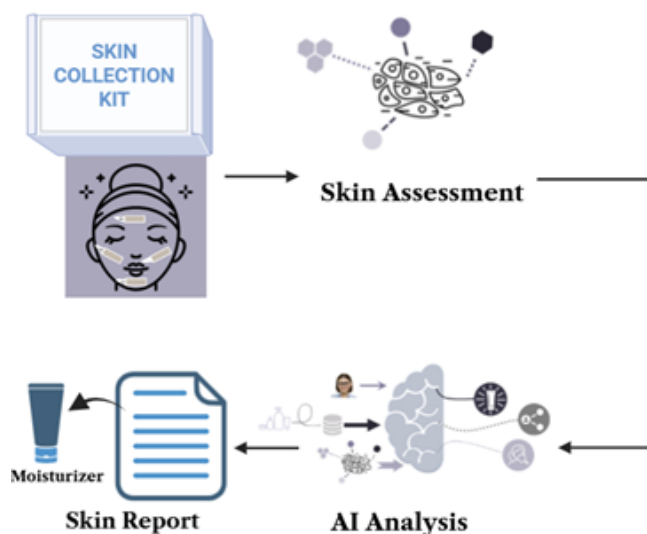
- **Molecular-level precision** delivers genuinely personalized skincare recommendations
- **Data-driven approach** replaces marketing hype with scientific evidence
- **Consumer-friendly reports** balance scientific insight with accessible guidance
- **Scientifically validated** product-to-skin matching increases efficacy

TECHNOLOGY FEATURES

- **Mass spectrometry analysis** of skin composition identifies individual biomarkers
- **Proprietary AI algorithm** determines optimal product ingredients for skin characteristics
- **Comprehensive ingredient database** with scientific efficacy analysis
- **Scalable platform** adaptable to both clinical and direct-to-consumer applications

SUMMARY

Vanderbilt researchers have developed a novel skin assessment platform that analyzes the molecular composition of skin using **mass spectrometry** and employs **artificial intelligence** to match individuals with optimal skincare products. This technology delivers **scientifically informed, user-specific** insights and product guidance, enabling consumers to make evidence-based decisions about their skincare routines.



Skin phenotype assessment workflow showing how molecular analysis feeds into the AI recommendation engine to match consumers with optimal skincare products.

OTHER DETAILS

Intellectual Property Status:

US patent application: [US-2025-0104127-A1](#)

Stage of Development:

Proof-of-concept demonstrated with animal skin models. Initial AI algorithm developed with core functionality for data processing, product-ingredient mapping, and knowledge base analysis.

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