

# INNODERM

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## D5.5: SECOND REPORT ON MESOSCOPY IMAGING FEATURES AND SKIN DISEASES

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## 1. PURPOSE OF THIS DOCUMENT

During INNODERM we have performed pilot studies in which we have used RSOM to image a wide range of skin diseases. For each disease we found imaging features that could serve as biomarkers, in order to perform diagnosis, severity assessment, therapy monitoring, clinical decision making etc. In this report, which is an update to previously submitted Deliverable 5.4, we summarize the most promising imaging features validated in patients and published in scientific papers and its relationship to diseases. Further information can be found in the published papers listed in the table herein.

## 2. IMAGING FEATURES VS. DISEASES

**Table 1.** Imaged diseases along with corresponding biomarkers and publications.

| Disease                                   | Imaging Features/Biomarkers      | Article   |
|---|----------------------------------|---|
| Melanoma                                  | Depth of melanocytic cells       | <a href="https://doi.org/10.1101/2021.05.25.21257525">https://doi.org/10.1101/2021.05.25.21257525</a><br>(medRxiv, paper under-review in nature communications) |
|   | Vessel density                   |   |
|   | Average vessel length            |   |
|   | Total blood volume               |   |
|   | Tortuosity                       |   |
|   | Lacunarity                       |   |
|   | Fractal number                   |   |
| Inflammatory diseases (psoriasis, eczema) | Total blood volume               | <a href="https://doi.org/10.1038/s41551-017-0068">https://doi.org/10.1038/s41551-017-0068</a>   |
|   | Epidermal thickness              |   |
|   | Capillaries density              |   |
|   | Capillaries diameter             |   |
|   | Plexus width                     | In preparation (eczema)   |
|   | Capillaries thickness            |   |
| Scleroderma                               | Capillary density                | <a href="https://doi.org/10.1016/j.pacs.2018.02.002">https://doi.org/10.1016/j.pacs.2018.02.002</a>   |
|   | Capillary thickness              |   |
| Allergy                                   | Blood volume per surface         | <a href="https://doi.org/10.1111/cod.13563">https://doi.org/10.1111/cod.13563</a>   |
|   | Width of vascularized dermis     |   |
|   | Ratio low/high frequency content |   |
|   | Vessel fragmentation             |   |
| Phototesting                              | Change of blood fraction         | <a href="https://doi.org/10.1111/bjd.19463">https://doi.org/10.1111/bjd.19463</a>   |
|   | Microvessel diameter             |   |

Table 2.1. is an updated table from Deliverable 5.4. In addition to outlining the imaging features and related diseases, a list of publications with detailed information on the subject is included.

### 3. CONCLUSIONS AND FUTURE PLANS

Here, we have presented Deliverable 5.5, which is an updated, public version of the information enclosed in Deliverable 5.4. detailing mesoscopy imaging features and their relation to skin diseases as was shown by RSOM image and feature extraction. Future plans consist on further exploring the most robust biomarkers in large blinded clinical studies in order to delimitate more accurately the clinical values of the technology.