

Measurement of Chemical Penetration and Distribution in Skin using Raman imaging and Multivariate Curve Resolution - Alternating Least Square

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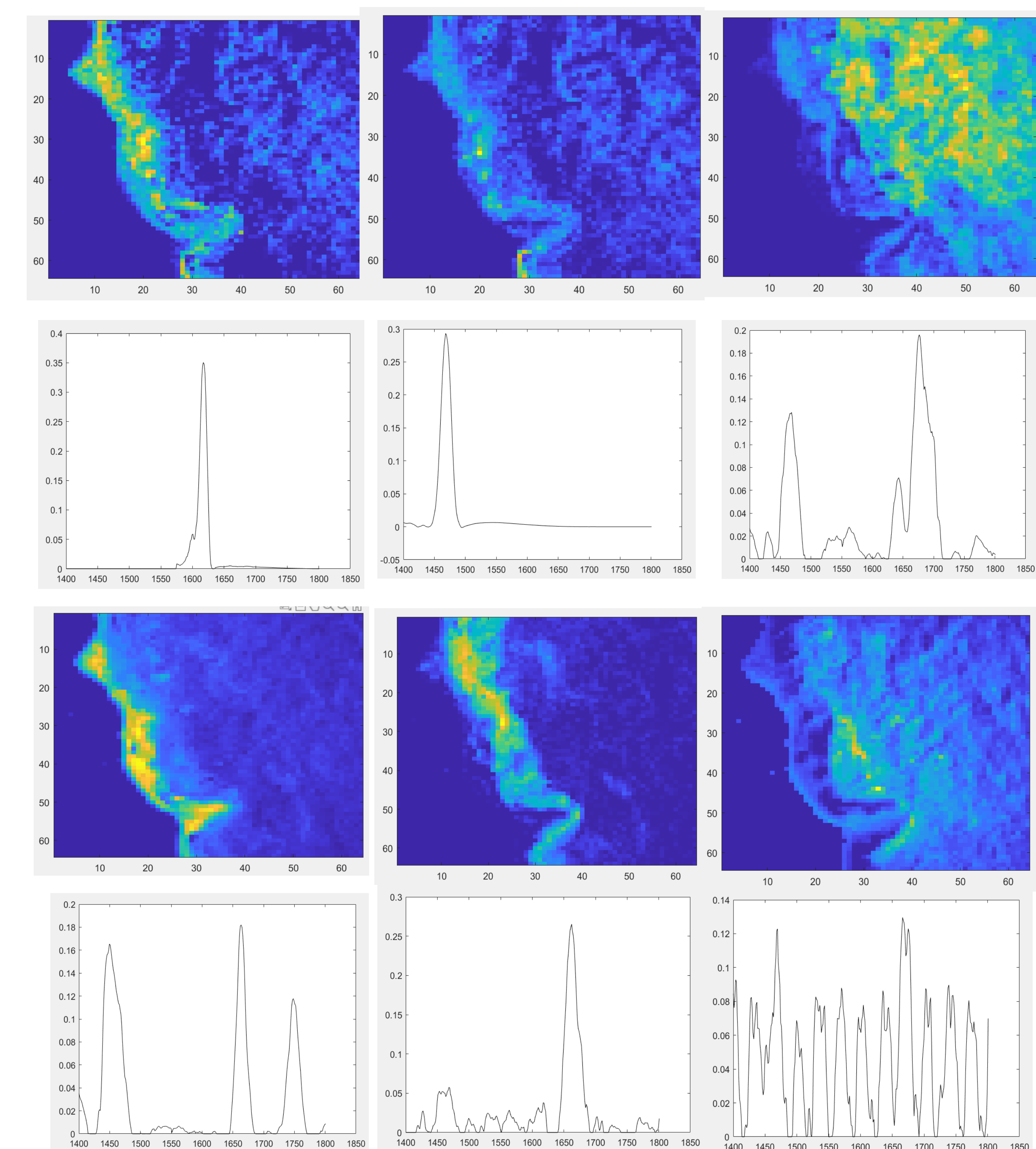
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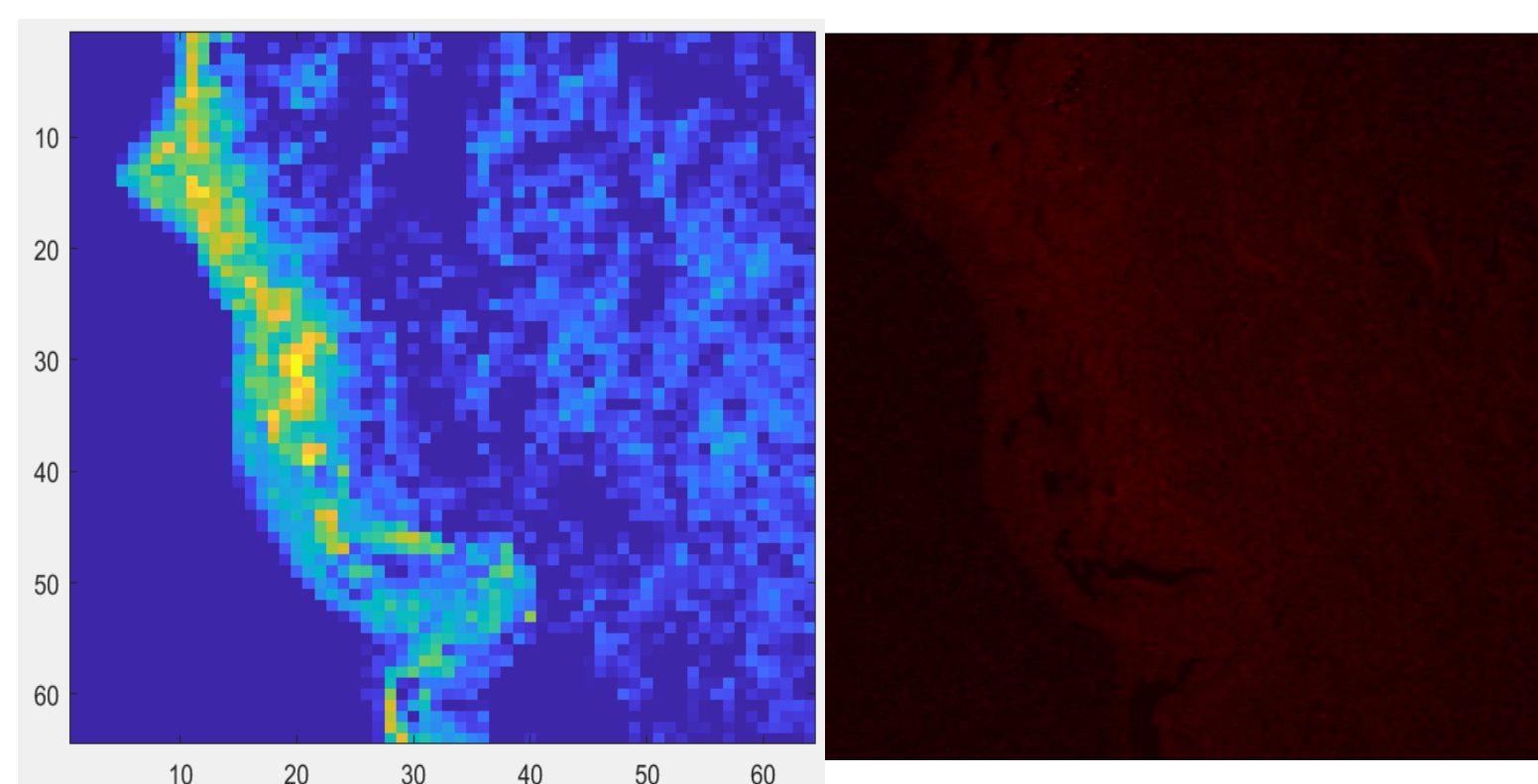
Aim

- Analyse penetration of chemical in skin
- Depth of penetration
- Penetration pathways
- Separate signal contribution of target species from skin

Results: MCR-ALS analysis of cyanophenol dosed skin



Similarity between predicted and experimental distribution is 68%



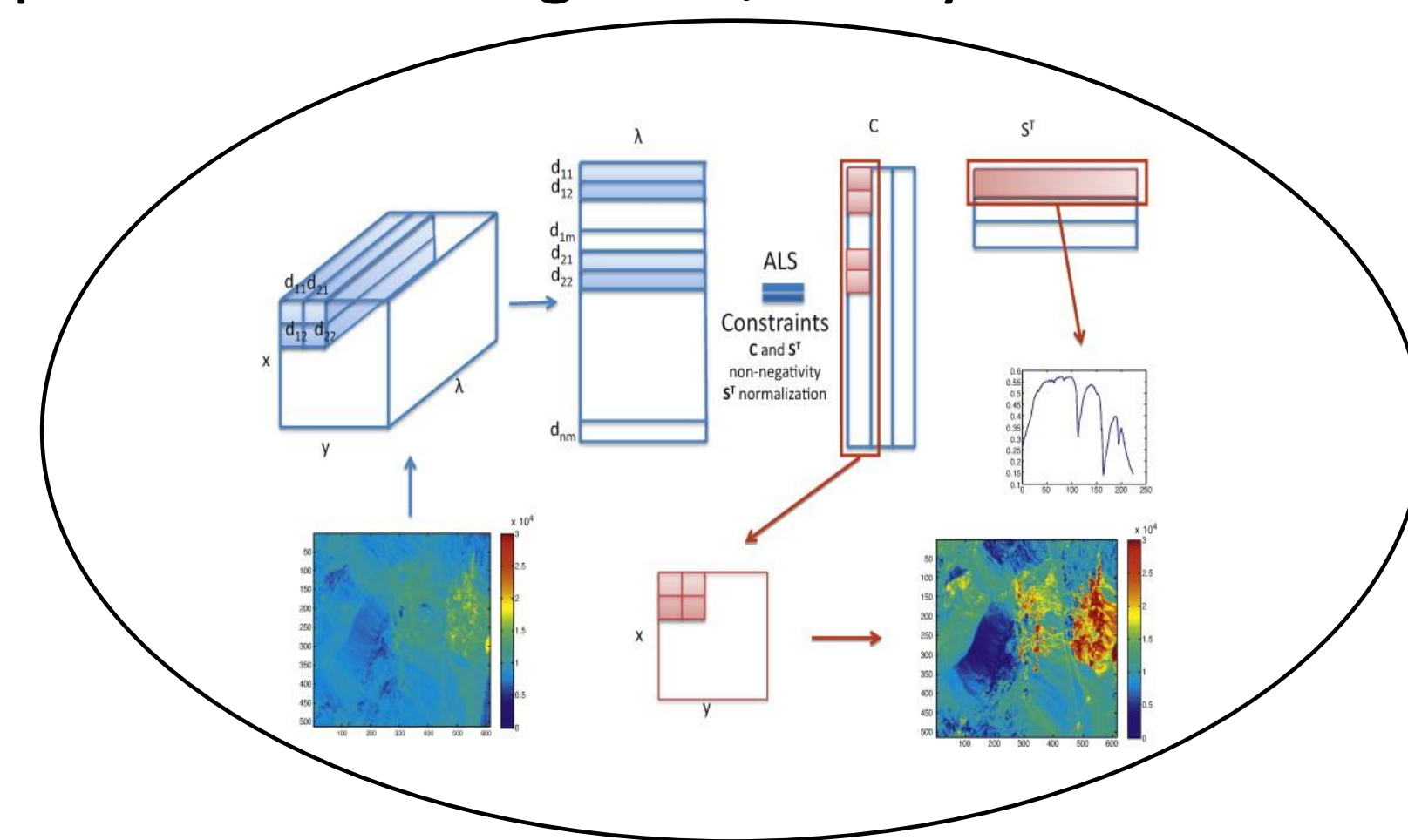
Conclusions

- SRS imaging analysed penetration pathways of retinol and cyanophenol in the skin
- Developed MCR-ALS methodology to unmix signals in hyperspectral dataset
- Similarity b/w experimental and predicted distribution is 68% - improvement in progress

Methodology

- SRS imaging – non invasive technique with submicron spatial resolution
- Spectral unmixing by combining hyperspectral imaging with multivariate analysis
- MCR-ALS: Decomposes data matrix into components' contribution

Adapted from Zhang et al, Analytica Chimica Acta, 2013



Hyperspectral scan in fingerprint region $1400\text{cm}^{-1} - 1800\text{cm}^{-1}$

MCR-ALS Analysis

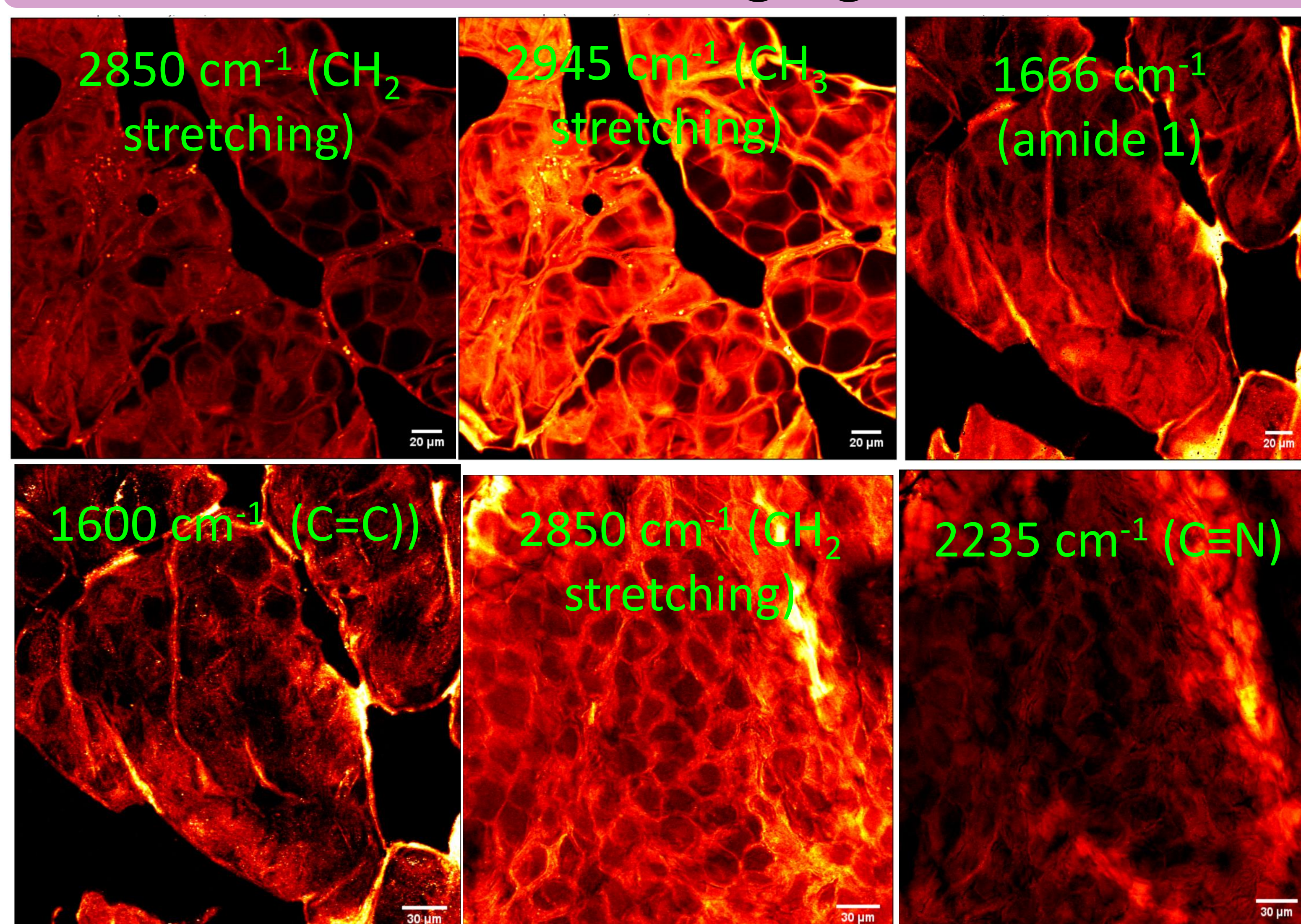
Predicted CP distribution

SRS imaging in silent region 2235cm^{-1}

Experimental CP distribution

Similarity Analysis

Results : SRS imaging of skin



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