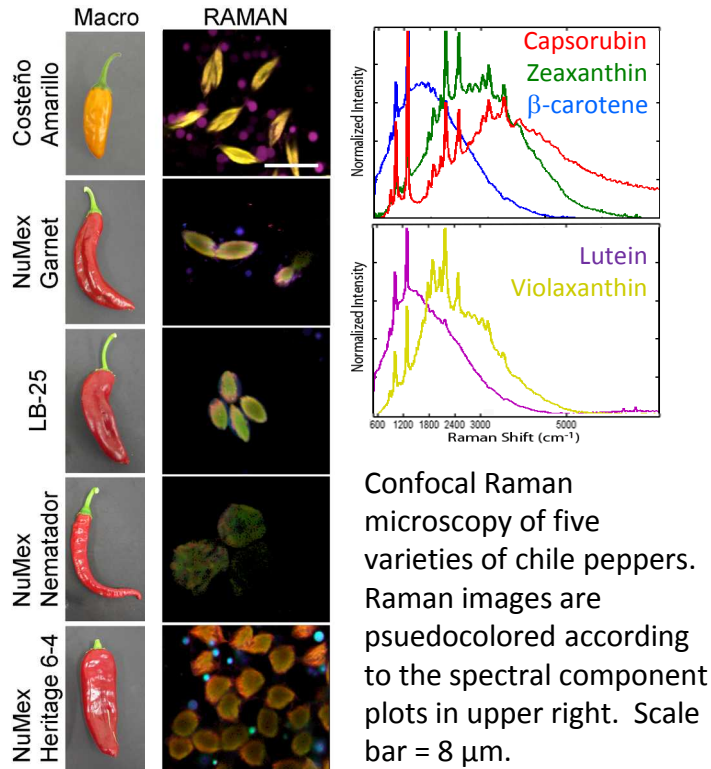


# What Color are Your Chile Peppers?

## Distinguishing Carotenoids in Living Organisms and Tissues

SAND2013-8083P



Kilcrease J, Collins A, Richins, R, Timlin J, O'Connell M.  
 "Multiple microscopic approaches demonstrate linkage between chromoplast architecture and carotenoid composition in diverse capsicum annum fruit" The Plant Journal, 2013, in press

Raman microscopy and spectral image analysis was performed at Sandia National Laboratories as part of PARC.

### Scientific Achievement

Subcellular discrimination and relative quantification of multiple carotenoid pigments in vivo

### Significance and Impact

This work and the associated enabling Raman microscopy technology provides a significant increase in the fundamental understanding of carotenoid biosynthesis. Carotenoids are intertwined in a variety of biological pathways, thus this work broadly impacts diverse field such as

- Dietary health and nutrition
- Biofuels and bioenergy

### Research Details

- Hyperspectral confocal Raman microscopy provides chemical resolution of 5 carotenoids in intact, mature chile pepper tissue
- Differential localization of carotenoids to chromoplast and lipid bodies is species specific and correlated with chromoplast structure
- Pigment results confirmed by HPLC and ultrastructure examined by TEM and SEM.



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