

# Synthesis of Novel Organic Polymers



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Areas of expertise: Organic Synthesis

### Grants and awards:

“Antifungal Compounds in Seeds of Pioneer Plants” Hope College-Howard Hughes Medical Institute, Grant for Interdisciplinary Research, \$10,000, 2005 (joint with K. Greg Murray).

Key publications and presentations: J. W. Veldman, K. G. Murray, A. L. Hull, J. M. Garcia-C., W. S. Mungall, G. B. Rotman, M. P. Plosz, and L. McNamara “Chemical Defense and the Persistence of Pioneer Plant Seeds in the Soil of a Tropical Cloud Forest” accepted for publication in *Biotropica*.

## Isolation of Chemical Defense Compounds from Tropical Pioneer Plant Seeds

Variation in seed persistence among pioneer plants in the cloud forests of Costa Rica is important in maintaining forest diversity patterns. Previous studies have revealed that the soil seed bank persistence of several pioneer plant species is largely due to the presence of chemical defense compounds. Our studies have identified the active toxins in *Bocconia frutescens* as Dihydro-sanguinarine, Dihydrochelirubine, Dihydro-chelerthrine, and Methoxydihydrochelerthrine. Isolation of these four compounds by extraction and column chromatography followed by mass quantification and GC-MS characterization gave evidence indicating their sequestration in the seeds.

Utilizing a bio-directed fractionation procedure, combining HPLC and fungal toxicity assays the seed extracts of *Phytolacca rivinioides* and *Guettarda poasana* are being analyzed for the presence of active antifungal compounds.