

Arborescent Polypeptide Micelles For Drug Release

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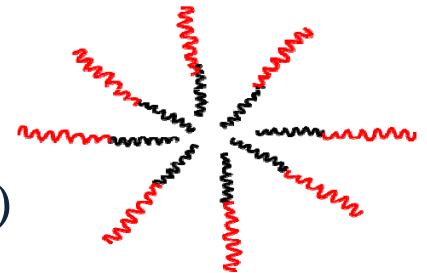
Main Project Objectives

- Synthesize biocompatible and biodegradable arborescent polymeric micelles.
- Optimize peptide coupling reactions (grafting yield and coupling efficiency)
- Demonstrate the suitability of arborescent copolymers micelles for applications in microencapsulation (drug delivery)

Polymeric Micelles

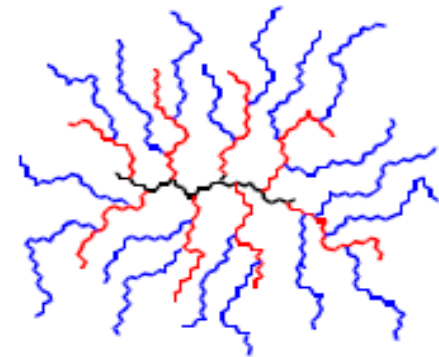
➤ Linear diblock copolymer micelles

- ✓ Dynamic structure
- ✓ Critical micelle concentration (unstable at $C < \text{CMC}$)

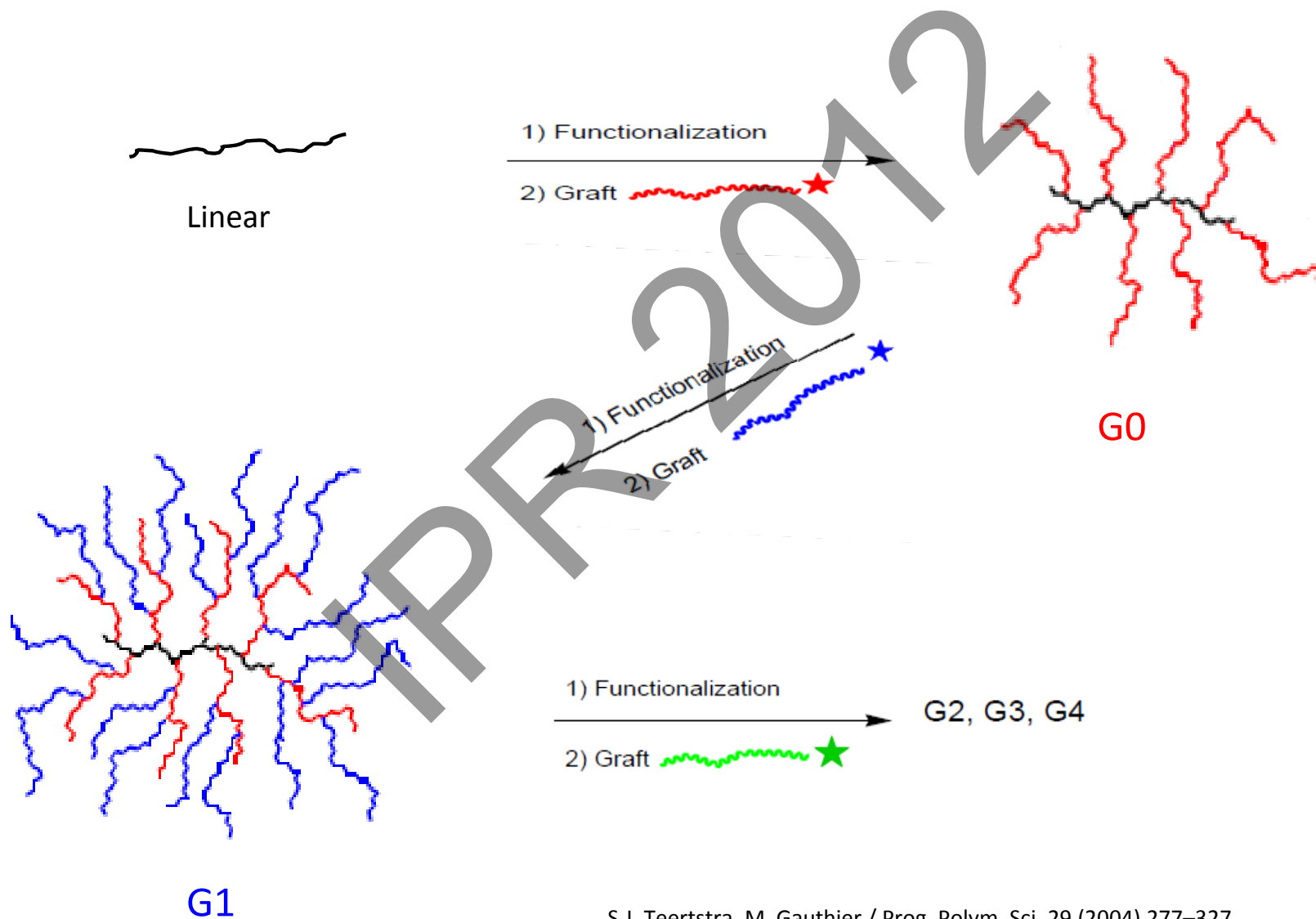


➤ Arborescent micelles

- ✓ Unimolecular (non-associated) micelles
- ✓ Static structure (stable, no CMC)

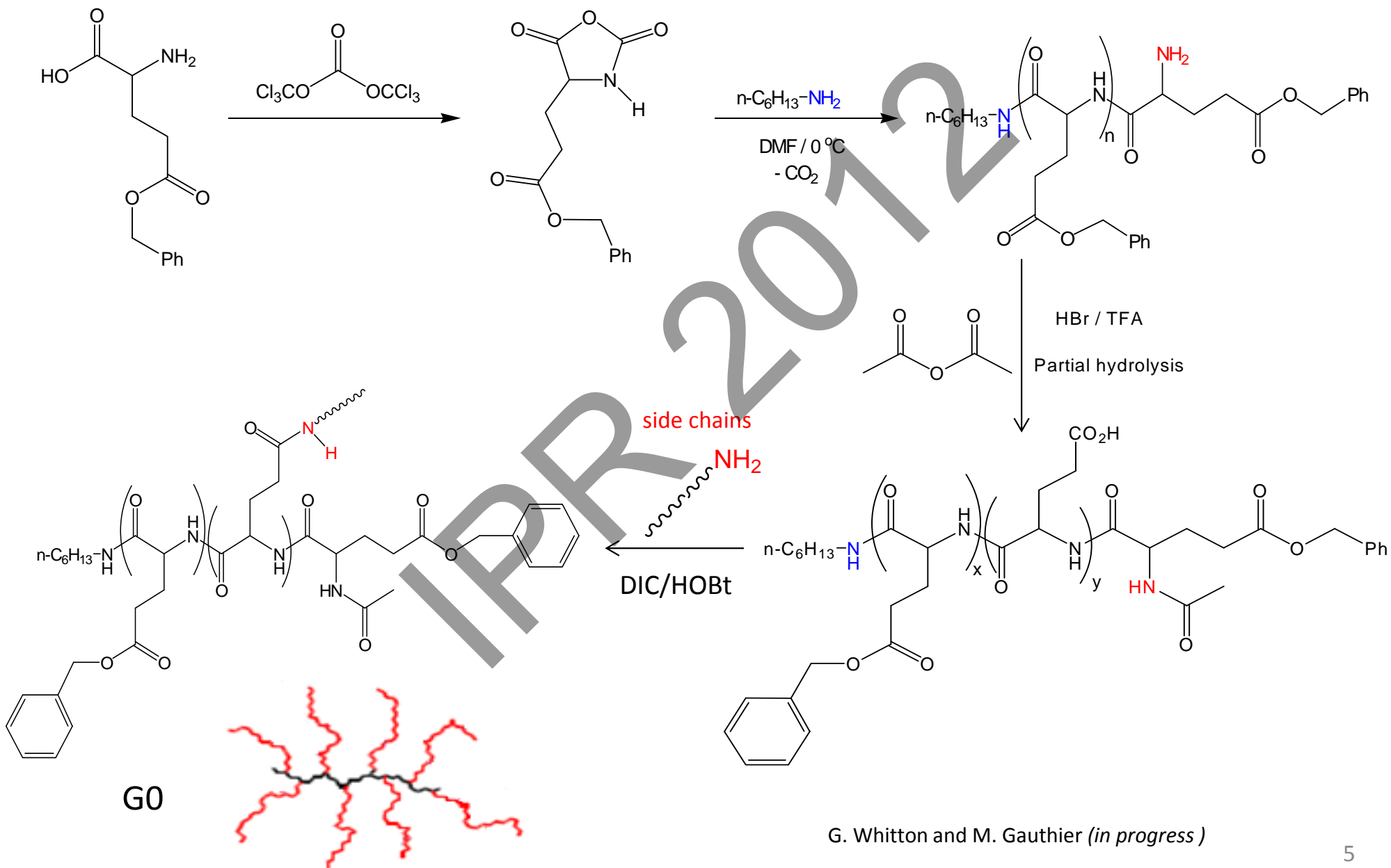


General Scheme for the Synthesis of Successive Generations of Arborescent Polymers



Overall Synthetic Scheme

(Ring Opening Polymerization)

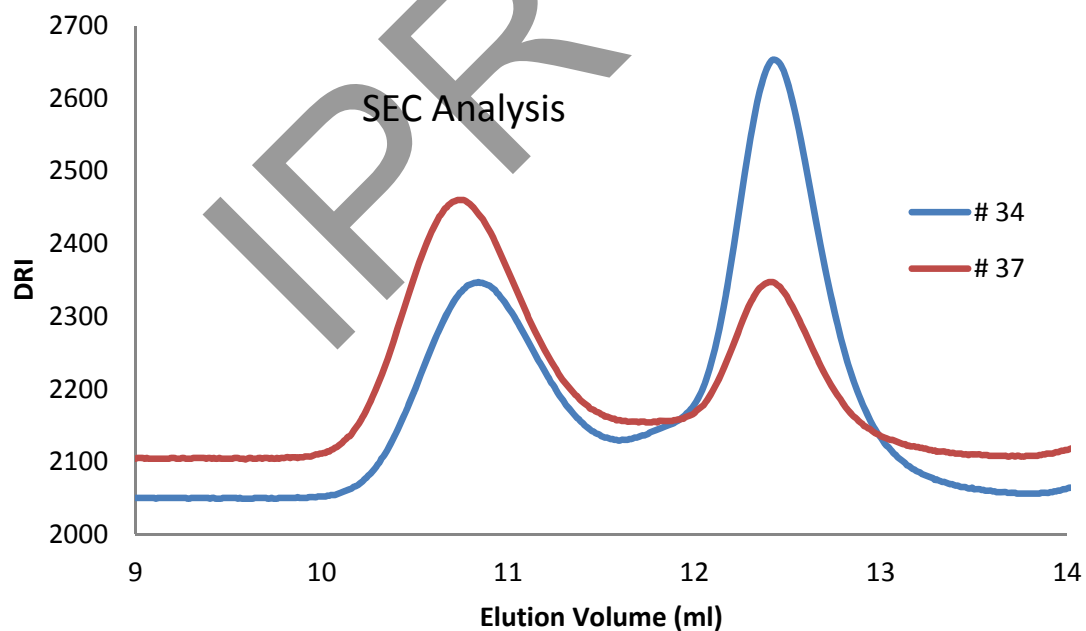


G. Whitton and M. Gauthier (*in progress*)

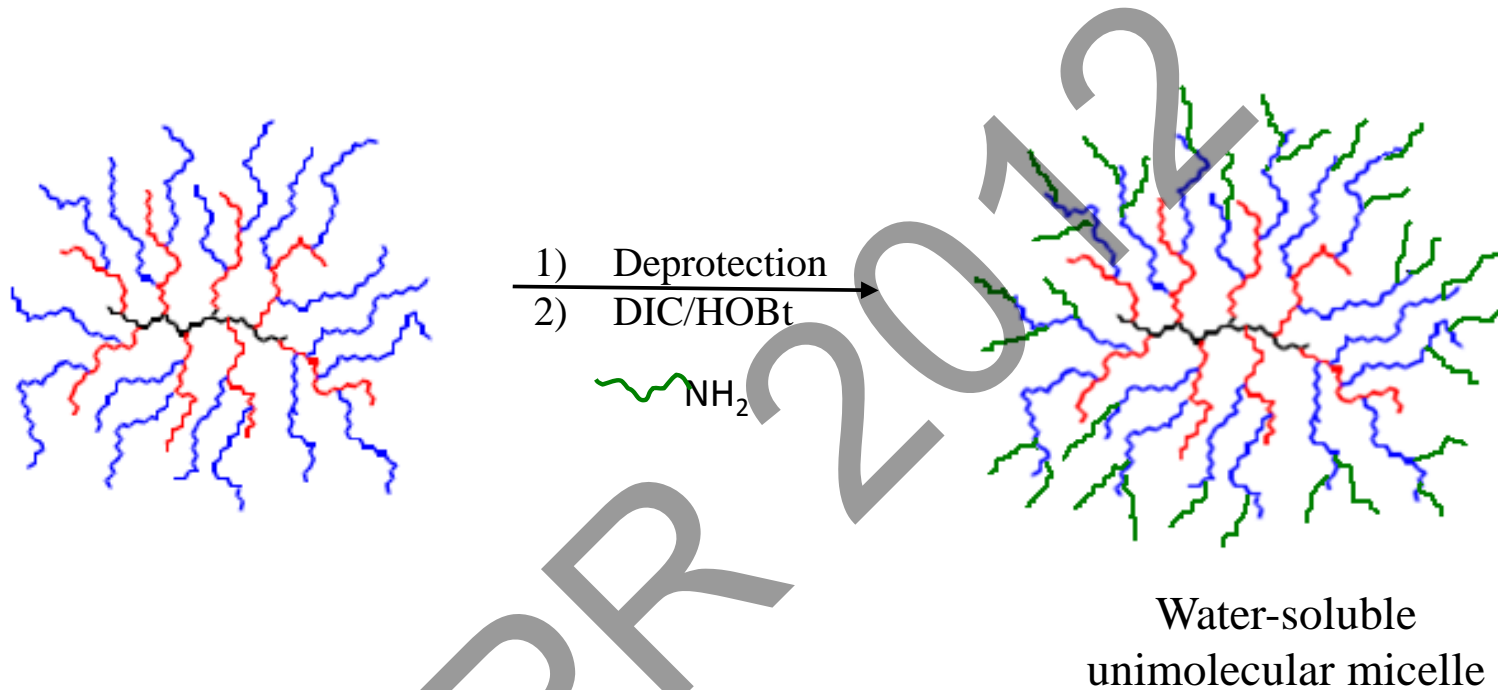
Influence of Reactants Molar Ratio on the *Grafting Yield*

Sample Name	molar ratio Side chains : substrate	MALLS		Grating Yield (%)
		M_n	M_w/M_n	
34	1 : 0.8	67,100	1.05	40
27	1 : 1	78,400	1.03	59
37	0.8 : 1	76,000	1.07	62

T= 25 °C in all reactions, solvent= DMF, Time= 64 h, Coupling reagents= DIC/HOBt



Micelles: Shell Addition



- Last grafting cycle: Hydrophilic side chains (e.g. polyglycidol).

Thank you

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