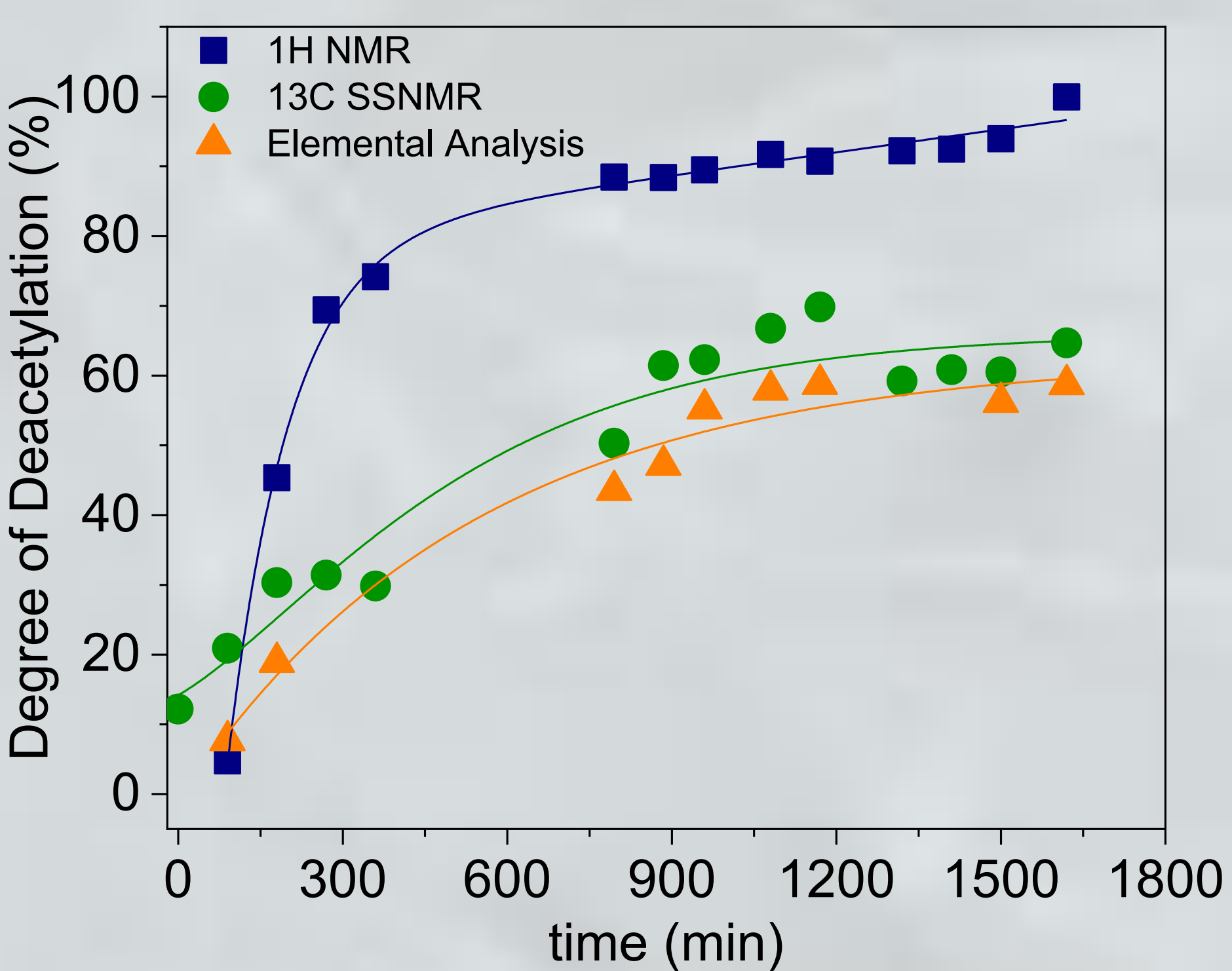
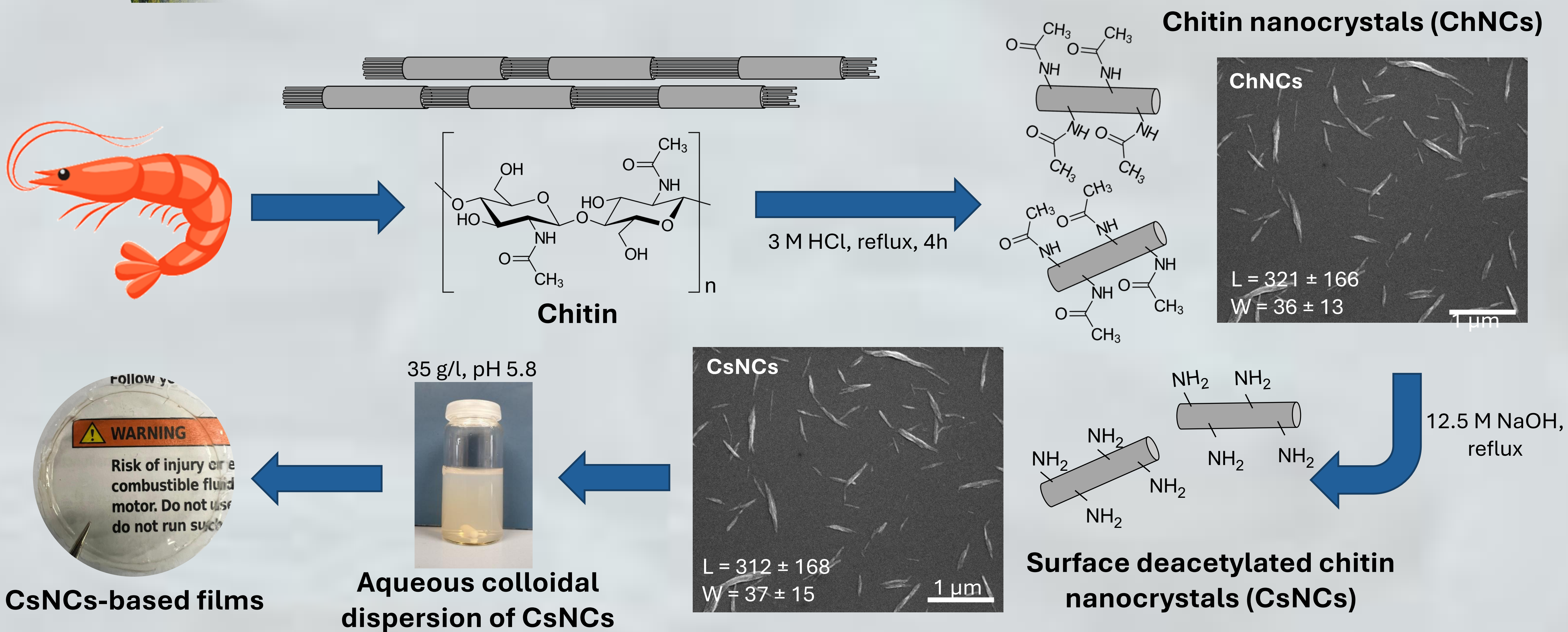


Sustainable bioactive films by self-assembly of natural polyphenols-containing chitin nanocrystals

Daniele Massari, Chiara Cestari, Maryam Rahimihaghighi, Laura Bressanelli, Massimo Sgarzi, Matteo Gigli, Claudia Crestini



$${}^1\text{H NMR in suspension}$$

$$DD_{1\text{H}}(\%) = \left[1 - \frac{1/3 \times I_{N-\text{COCH}_3}}{I_{\text{H}_2(\text{GlcNAc})}} \right] \times 100$$

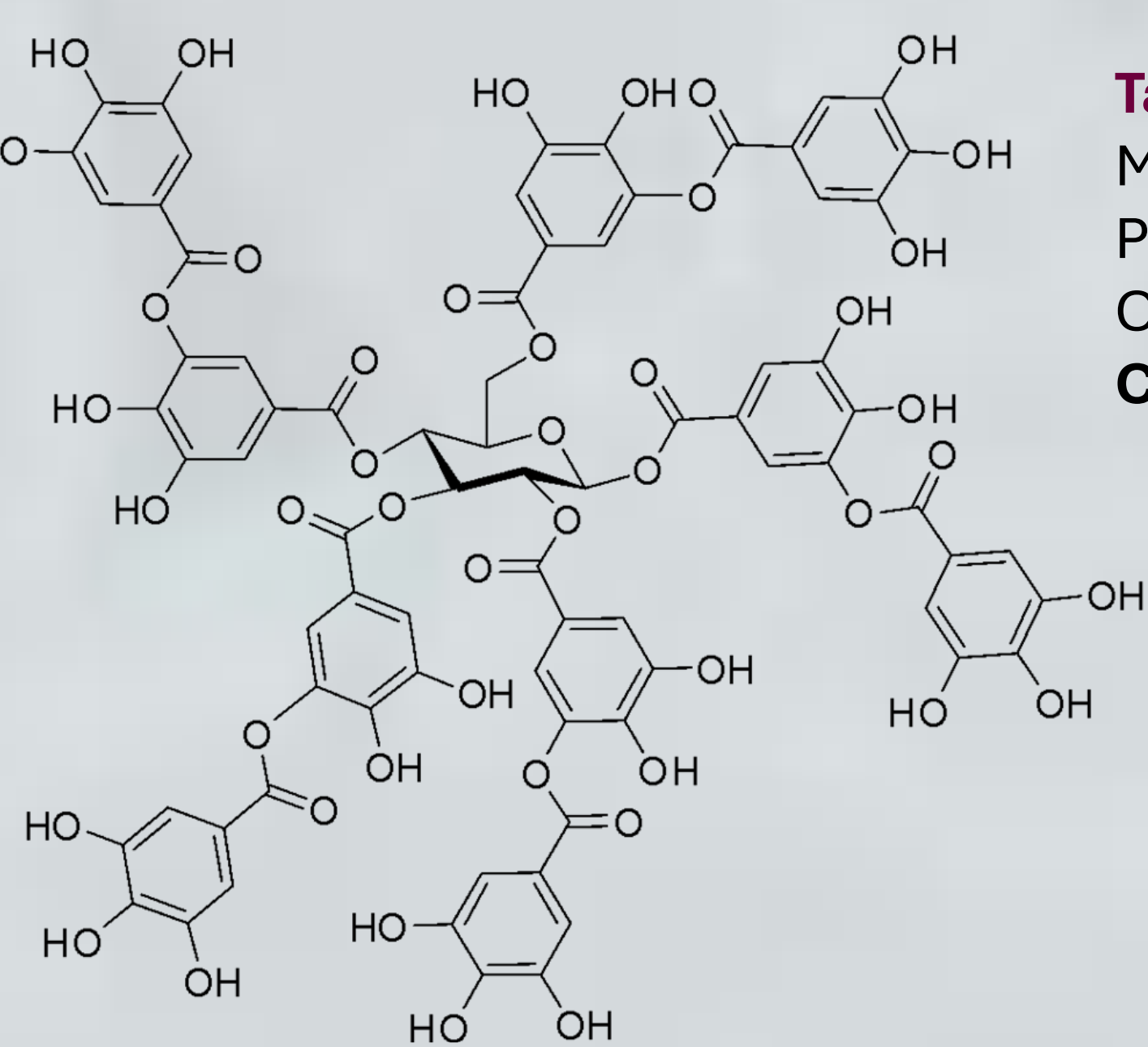
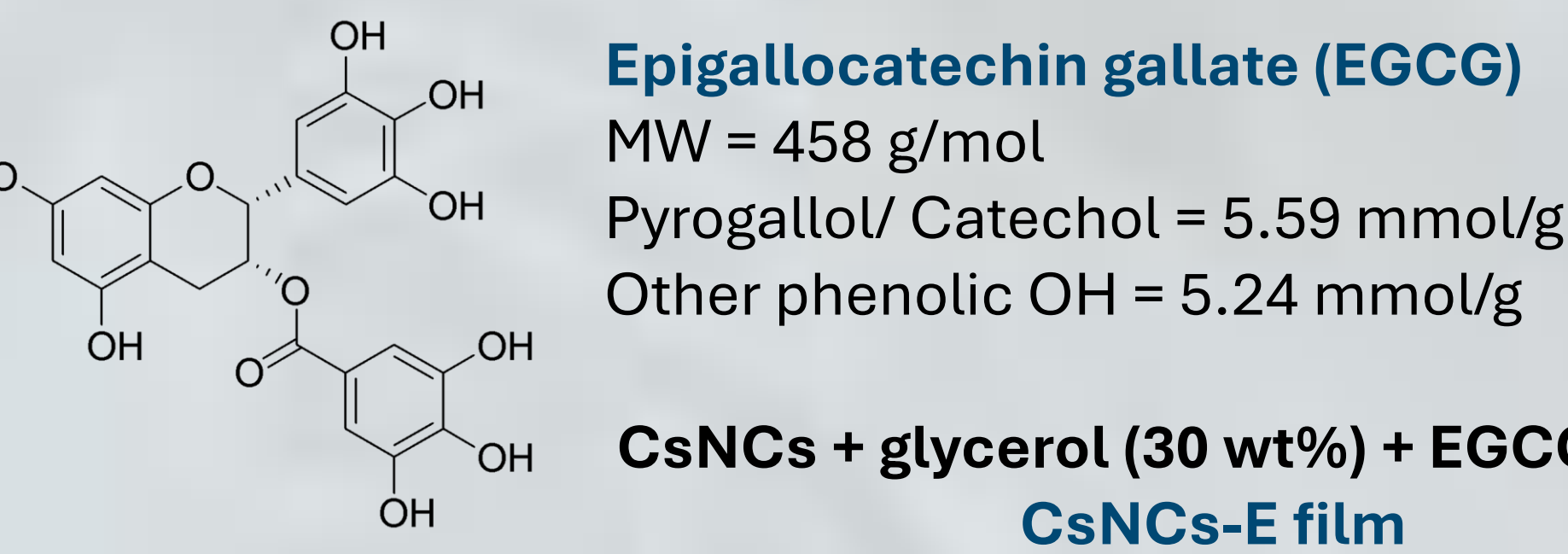
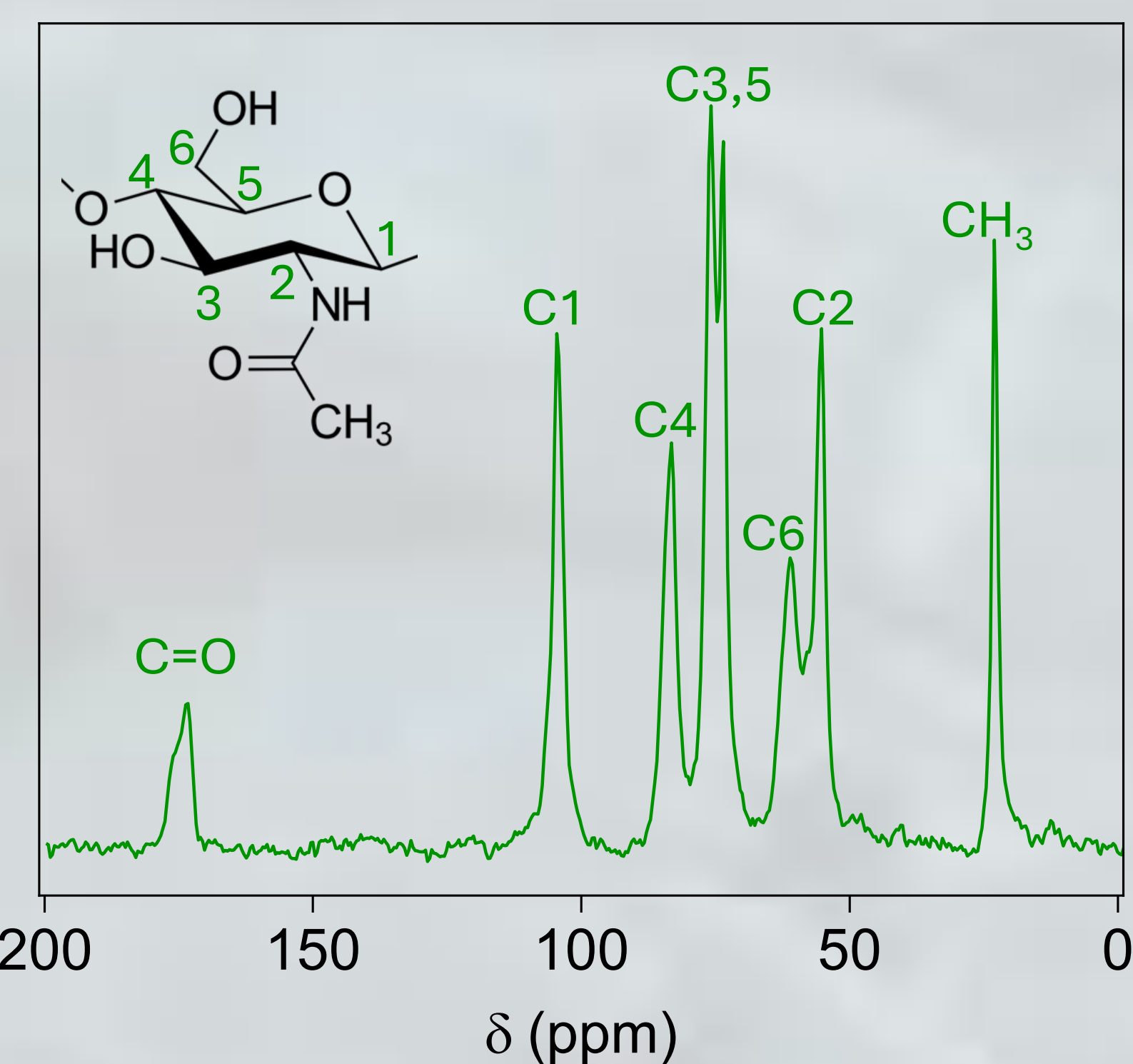
$${}^{13}\text{C Solid State NMR}$$

$$DD_{13\text{C}}(\%) = \left[1 - \frac{I_{\text{CH}_3}}{\text{Average}(I_{\text{C}1-\text{C}6})} \right] \times 100$$

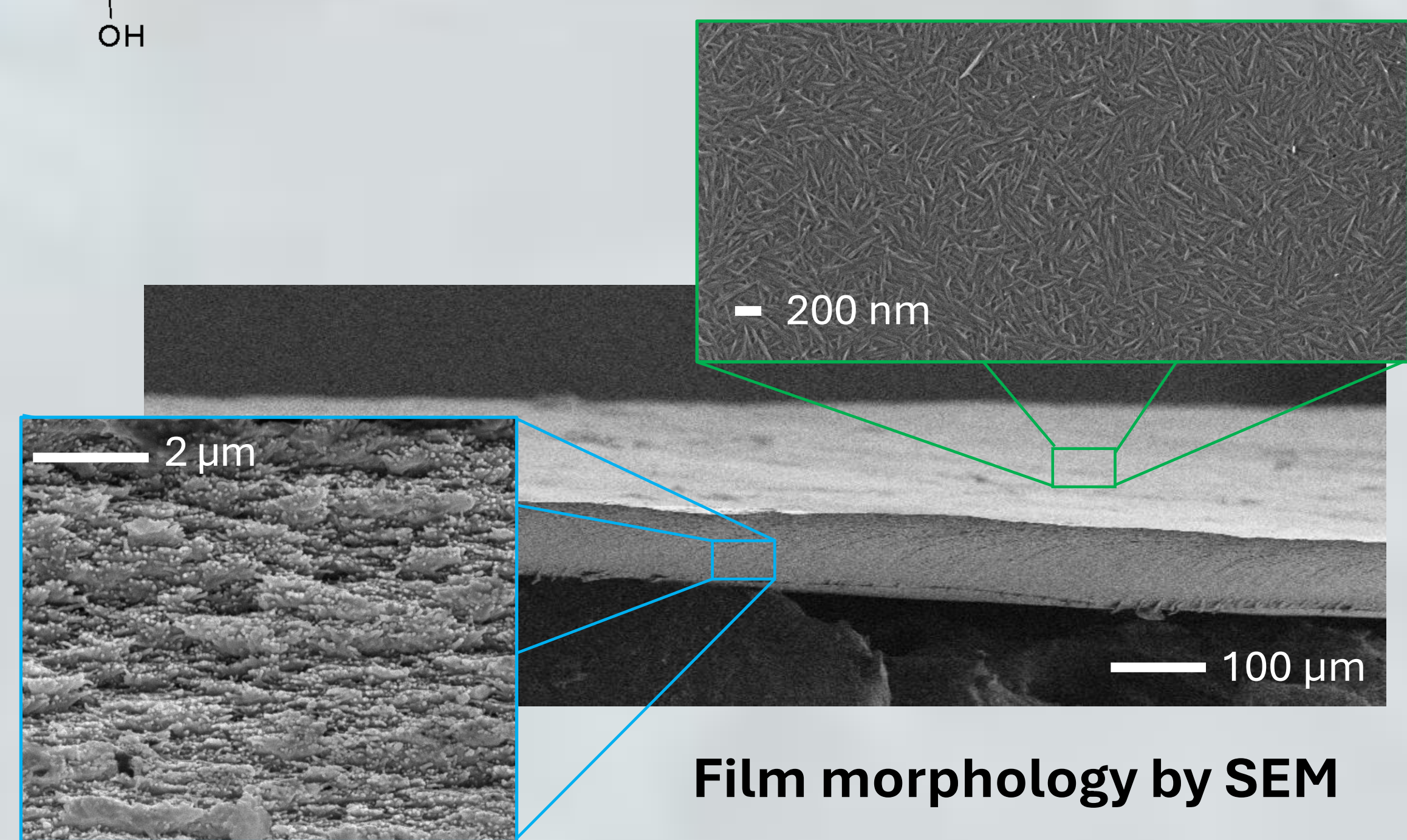
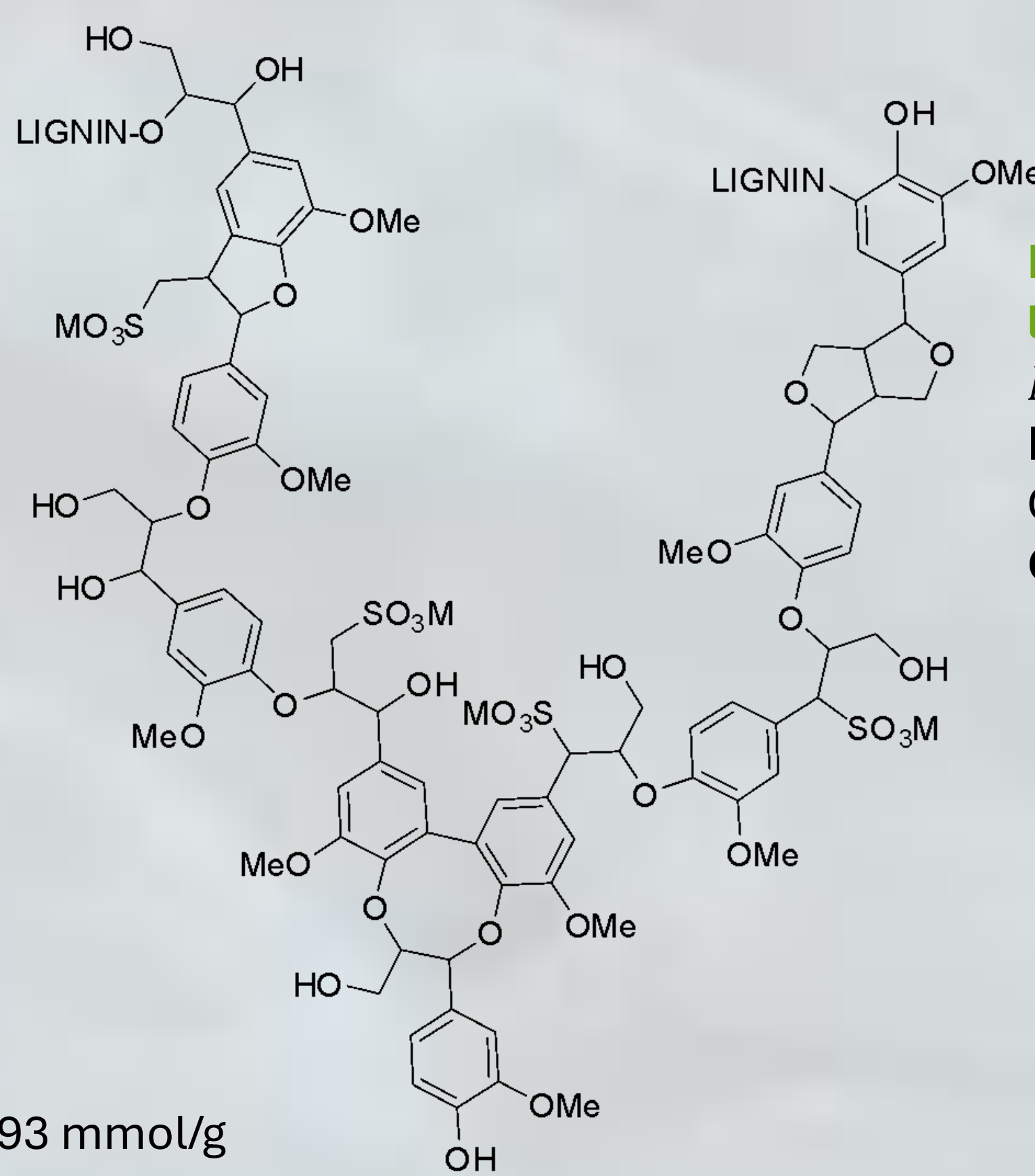
$$\text{Elemental analysis}$$

$$DD_{\text{CHNS}}(\%) = 100 \times (4 - 0.583093 \times w_{\text{C}/\text{n}})$$

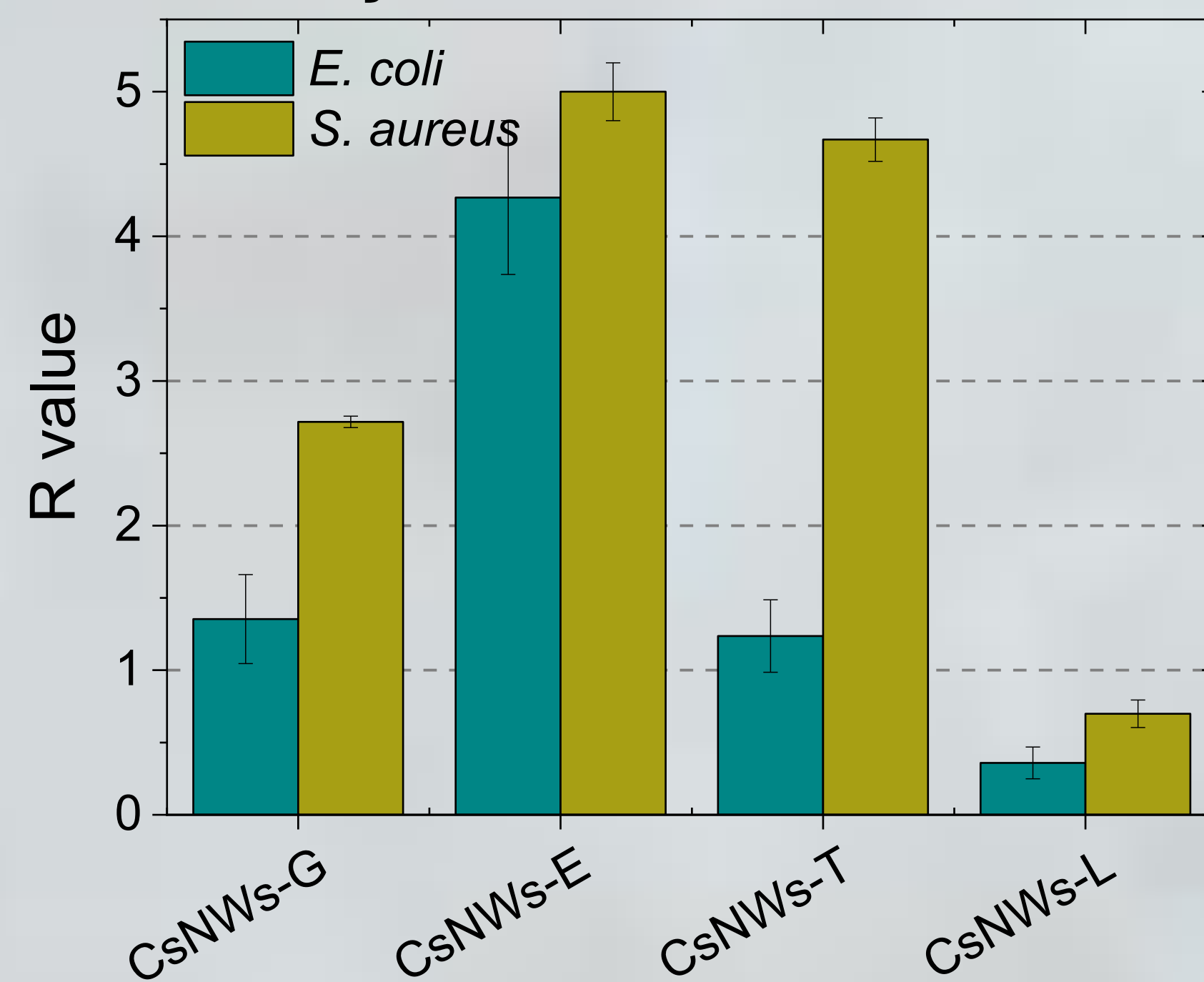
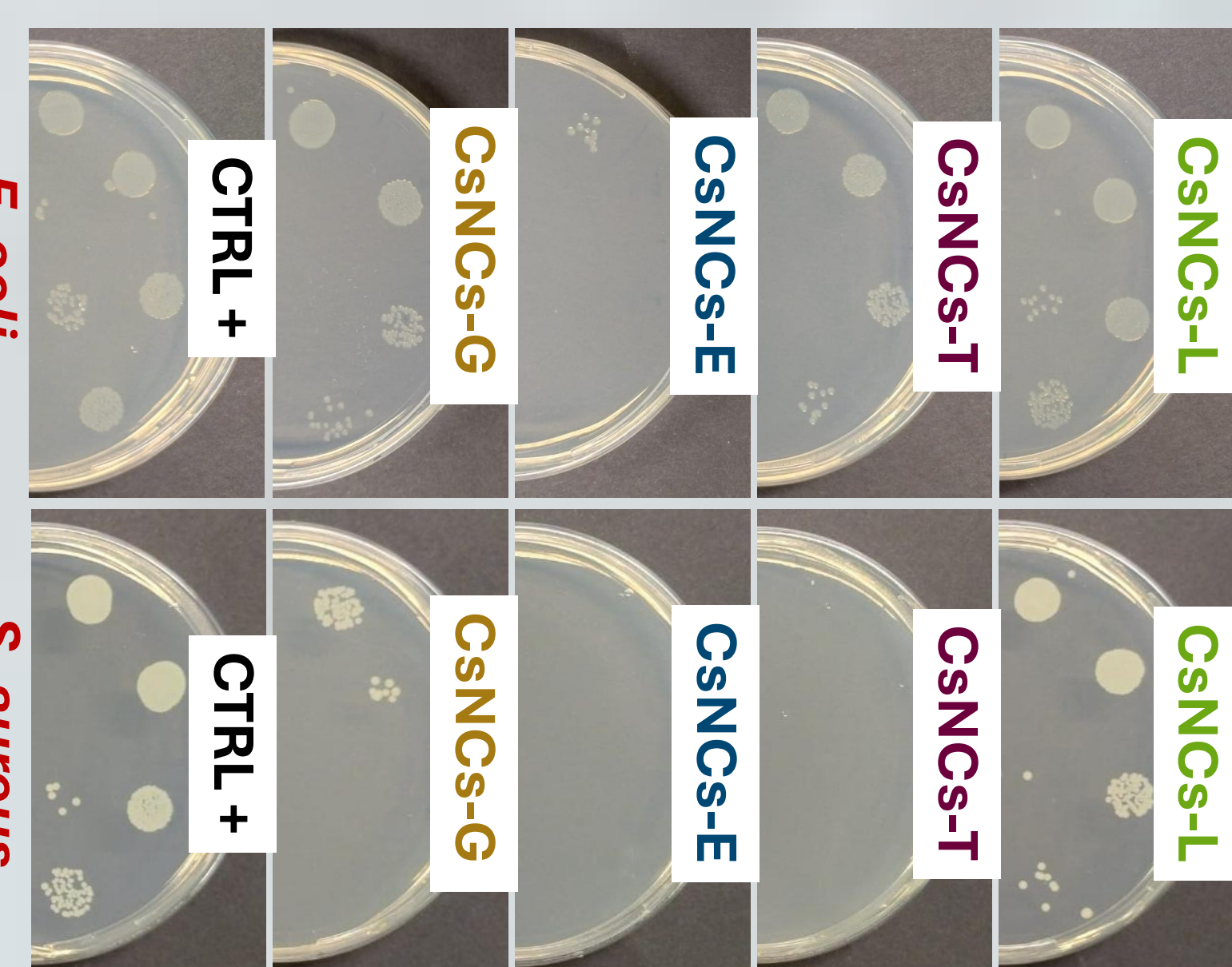
$$w_{\text{C}/\text{n}} = \frac{\text{total mass of carbon in sample}}{\text{total mass of nitrogen in sample}}$$



CsNCs + glycerol (30 wt%) → **CsNCs-G film**



Antibacterial activity



Antioxidant activity (DPPH assay)

