Existing tissue adhesives and sealants are far from satisfactory when applied on wet and dynamic tissues.

Li et al. reported a strategy for designing biodegradable super-strong aqueous glue (B-Seal) for surgical uses inspired by an English ivy adhesion strategy and a cement particle packing theory. B-Seal is a fast-gelling, super-strong, and elastic adhesive sealant composed of injectable water-borne biodegradable polyurethane (WPU) nanodispersions with mismatched particle sizes and counterions in its A-B formulation. B-Seal showed 24-fold greater burst pressure than DuraSeal®, 138-fold greater T-pull adhesive strength than fibrin glue, and 16-fold greater lap shear strength than fibrin glue. In vivo evaluation on a rat cerebrospinal fluid (CSF) rhinorrhea model and a porcine craniotomy model validated the safety and efficacy of B-Seal for effective Cerebrospinal fluid fistula prevention and dura repair. The plant-inspired adhesion strategy combined with particle packing theory represents a new direction of designing the next-generation wet tissue adhesives for surgeries [1)].

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