Growth Factors and Induction in the Frog

1. Growth factors
   - superfamily of signaling/regulatory proteins
   - variety of functions (e.g., inc. cell proliferation)
   - generally act locally (between populations of cells)
   - effective at low concentrations (10^{-9} to 10^{-11} M)

2. Example growth factors (GF)
   - epidermal GF
     * proliferation of many cell types
     * inducer in development
     * a transforming growth factor (TGF)
     * neuron growth
     * survival of neurons
   - nerve growth factor
   - erythropoietin
     * prolif. red blood cell precursors
   - TGF B’s
     * potentiate/inhibit other GF actions
     * inducers in development
   - Insulin-like GFs
     * cell survival, metabolism, prolif.

3. Growth factor control of in early frog induction
   Possible role for Vg1 (a TGF B)

   - A: in situ hybridization for Vg1—vegetal cortical region
   - B: Vg1 mRNA maternal—translation
   - C: cytoplasmic activation—Vg1 moves to dorsal ventral region
     post-translation cleavage to active form, Nieuwkoop Ctr.(?)
   - D: released to induce overlying mesoderm to become the organizer