Neurogenesis/gliogenesis occur from neural induction:

Neuroepithelial cells become neurons and glia. Neuroepithelium are multipotent, undergoes linear restriction to eventually become neurons. Neuroblasts - Drosophila, Radial glia - vertebrates.

Neuroepithelial cells divide in the neural tube wall. Neuroepithelium divide close to the ventricular surface, migrate dorsally as they divide, then migrate back down to the ventricular surface.

Stages during neurogenesis: expansion phase (symmetric division predominant) followed by neurogenic phase (asymmetric division predominant)

Selection of neural progenitors, how?

- In drosophila, whe neuroblast delaminates into the coelom.
    - Competence of neuroblast is determined by global patterning patterns.
    - The dorsoventral and anterior-posterior gradients create proneural clusters, express **achaete/scute Ac/Sc** genes.
    - One cell delaminate from each proneural cluster, becomes the neuron, shown by **ISH**.
    - Achieved by delta-notch lateral inhibition + positive feedback, due to stochastic expression levels.
        - Delta expression, bind to Notch of neighbouring cells, inhibit proneural genes (neuroblast fate), inhibit delta expression.
        - **Experiment** overexpression of Delta in chick embryo leads to lack of neurons in the area.

When and how does asymmetric division occur?

- Asymmetric division follows delamination in Drosophila.
    - Division plane changes, become perpendicular to neuroepithelium tissue.
    - Apical components: Par-6, aPKC, Inscutable, Pins
    - Basal components: Miranda, Prospero, Numb, Brat, Lgl
    - Mutual inhibition: aPKC phosphorylate Miranda, Lgl phosphorylates aPKC
    - Ins-Pin complex at the apical pole help orientate centrosomes, promote asymmetric division.
    - In Drosophila, cells inheriting the apical components become the neuroblast, basal cell inherites numb, which inhibits notch signalling, becomes GMC.

- **Alexandre et al., 2010: GFP-marked zebrafish showed apical inheriting cell becomes the neuron**
    - More recent studies showed in vertebrates (e.g. chick), numb is localised at apical adherens junctions as well.