Introduction

- Almost all environmental chemicals necessary for life enter the body by nose and mouth.
- The senses of smell (olfaction) and taste (gustation) monitor such chemicals, determine the flavor and palatability of foods and beverages, and warn of dangerous environmental conditions, including fire, air pollution, leaking natural gas and bacteria-laden foodstuffs.

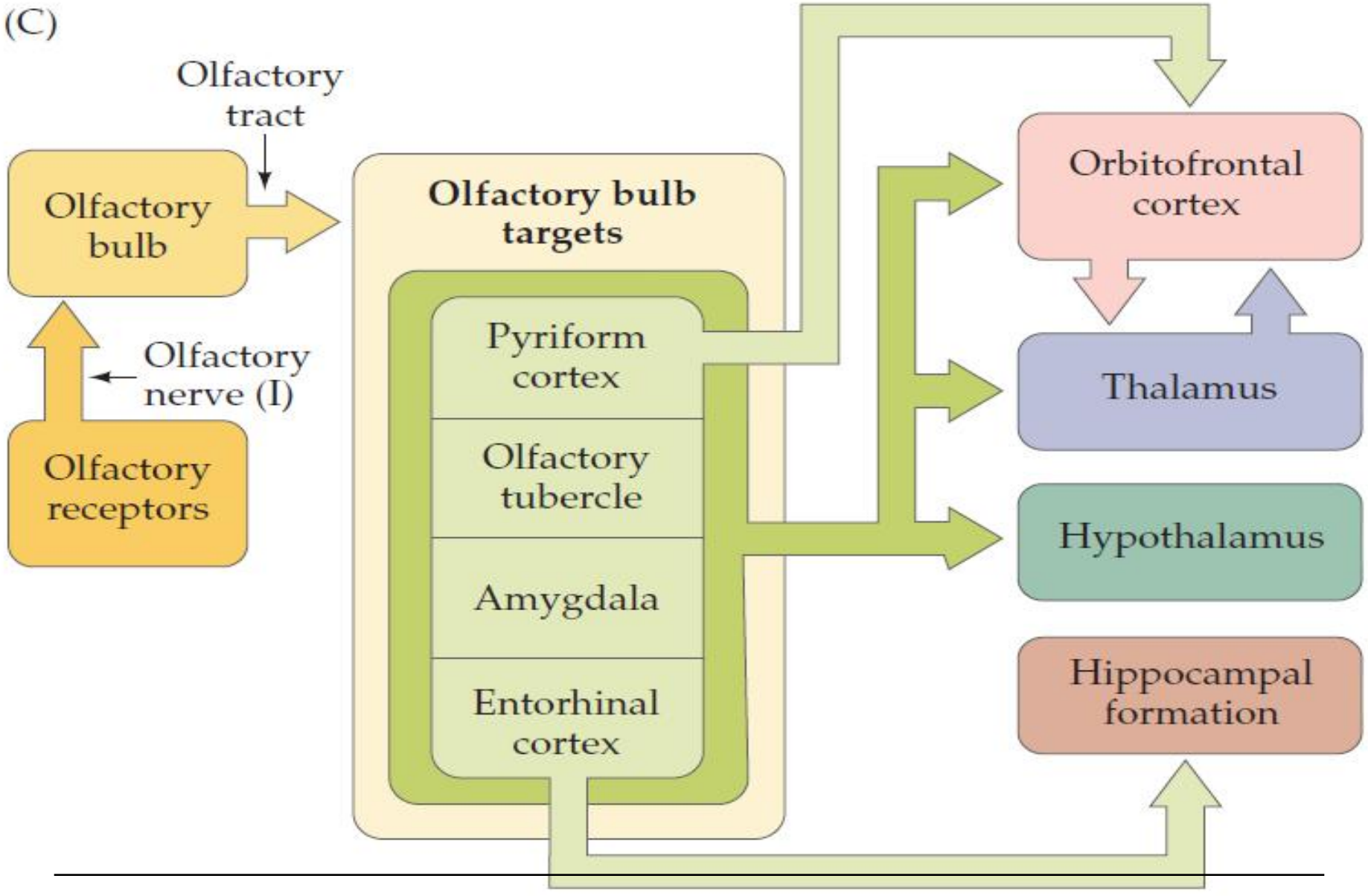
- These senses contribute significantly to quality of life and when dysfunctional can have untoward physical and psychological consequences.
- A basic understanding of these senses in health and disease is critical for the physician, because thousands of patients present to doctors' offices each year with complaints of chemosensory dysfunction.

- Among the more important recent developments in neurology is the discovery that decreased smell function is among the first signs, if not the first sign, of such neurodegenerative diseases as Parkinson's disease (PD) and Alzheimer's disease (AD), signifying their "presymptomatic" phase

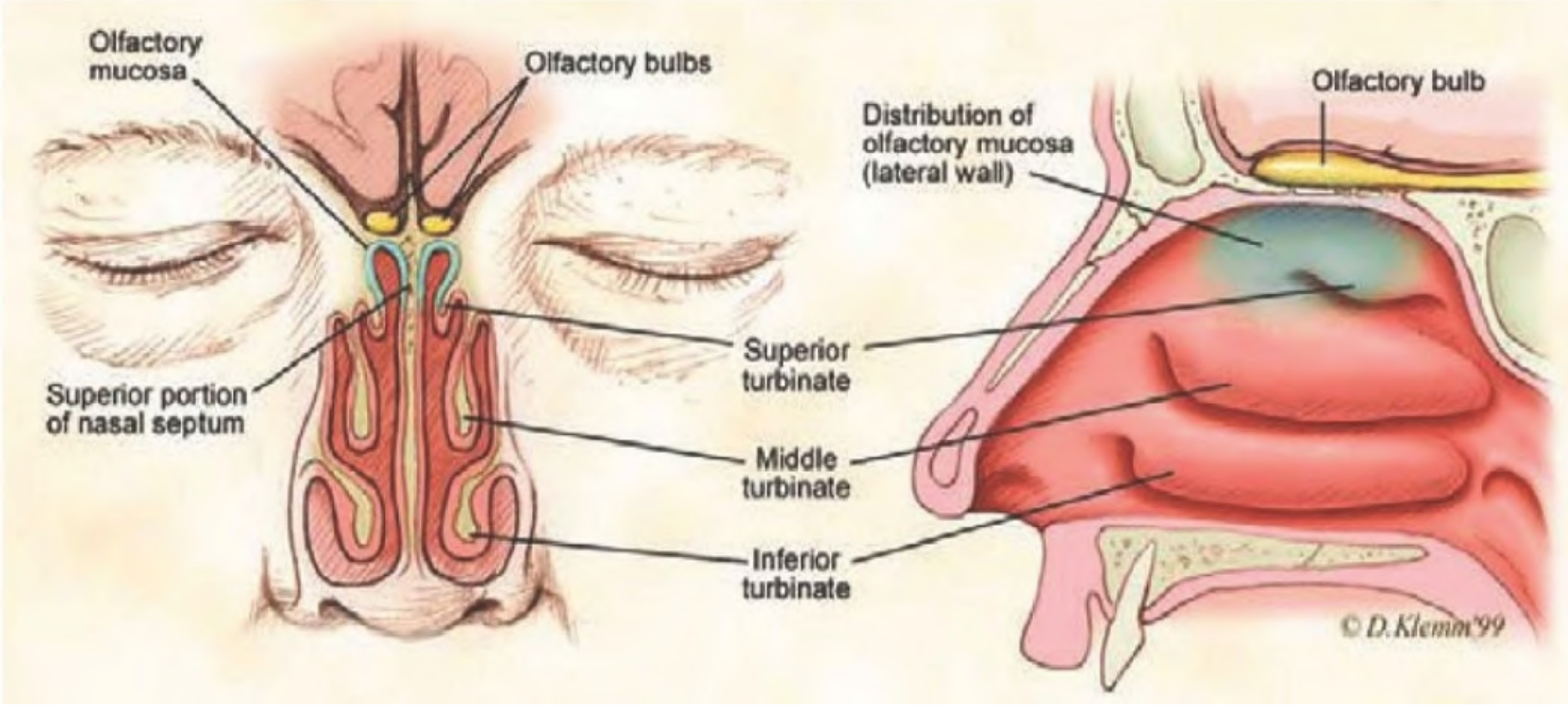
Olfactory nerve

- C N I
- Components - sensory (SVA)
- Function - olfaction (smell)
- Opening in skull through which it passes - cribriform plate of ethmoid bone

The basic pathways for processing olfactory information.

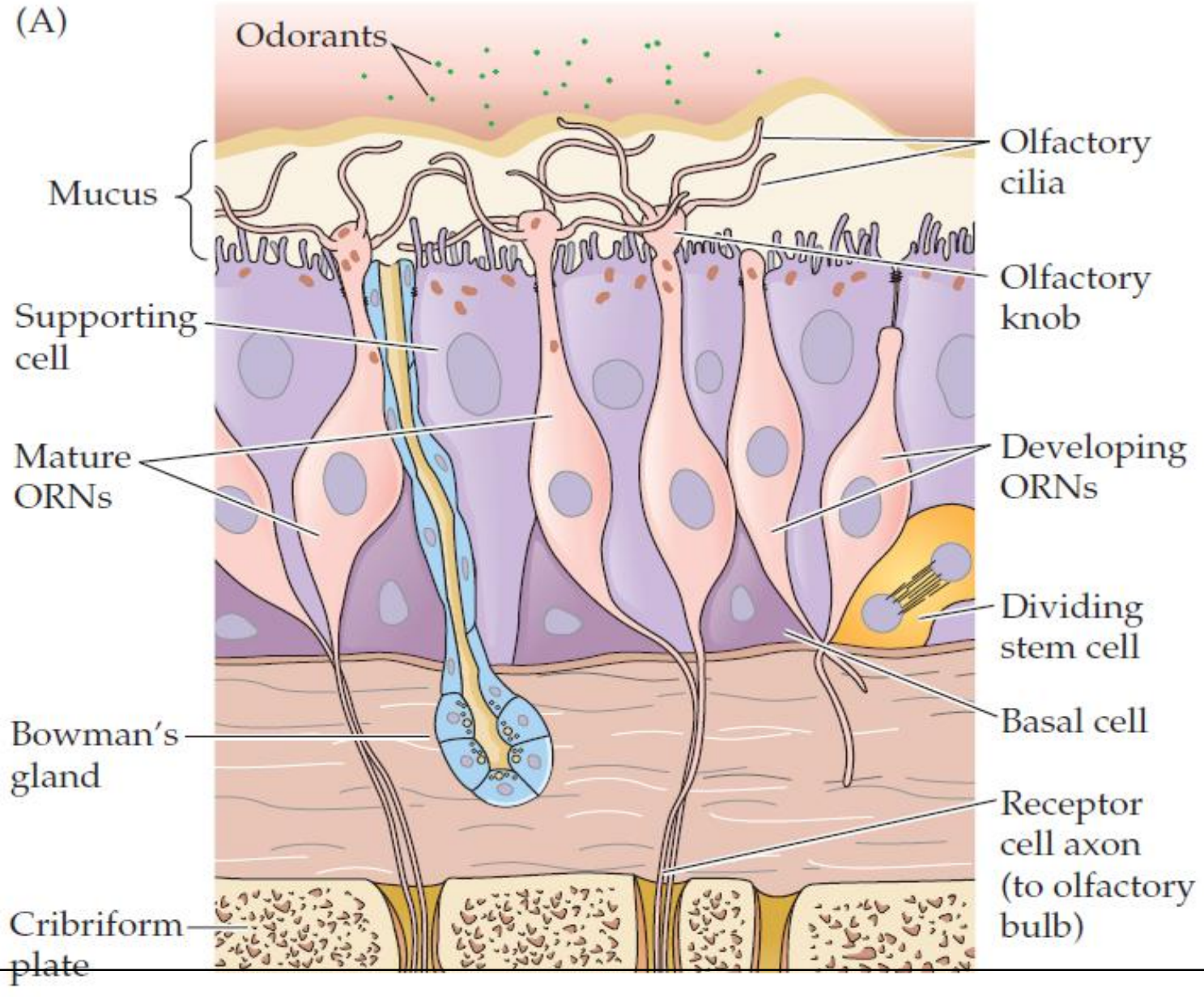


Anatomy of the olfactory neural pathways, showing the **distribution of olfactory receptors in the roof of the nasal cavity** (Copyright Oavid Klemm, Faculty and Curriculum Support [FACS], Georgetown University Medical Center)

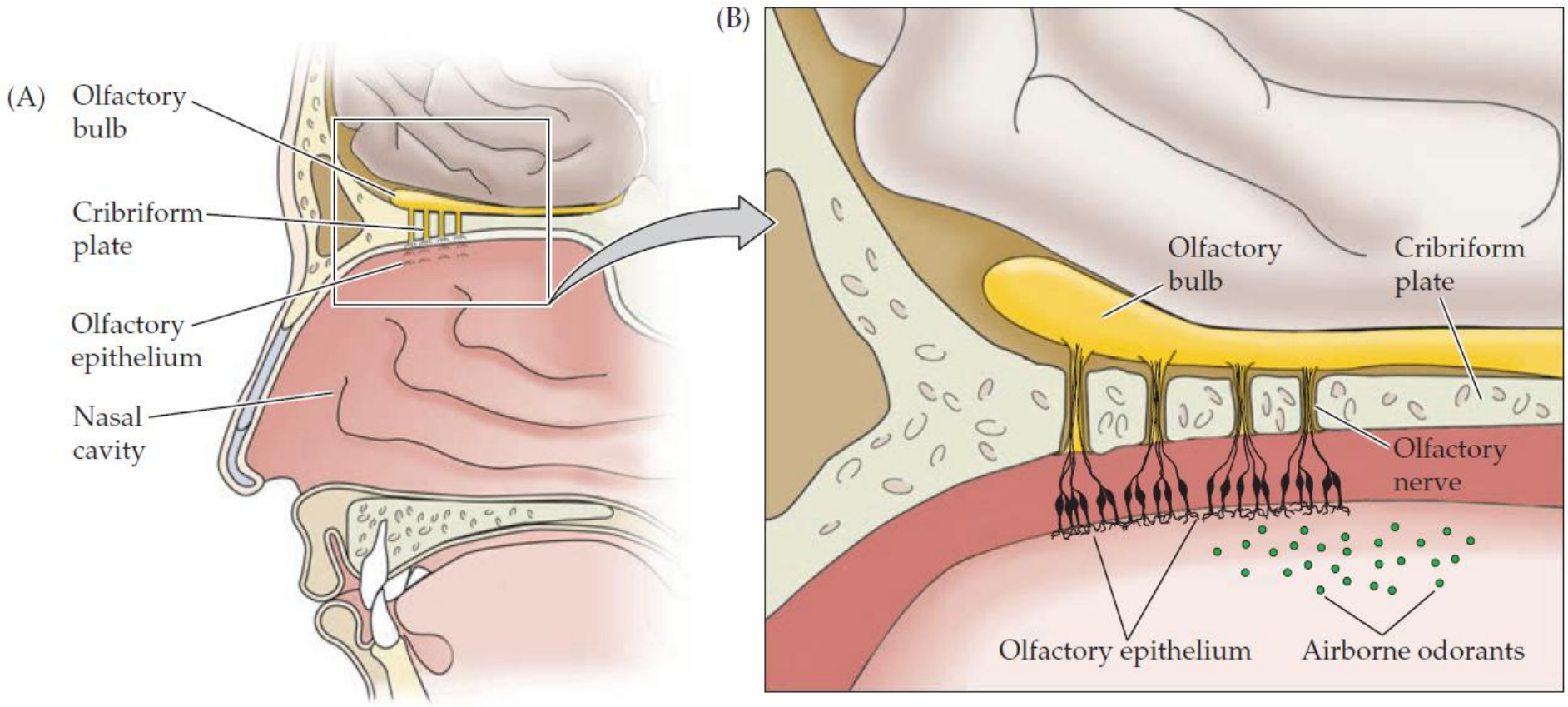


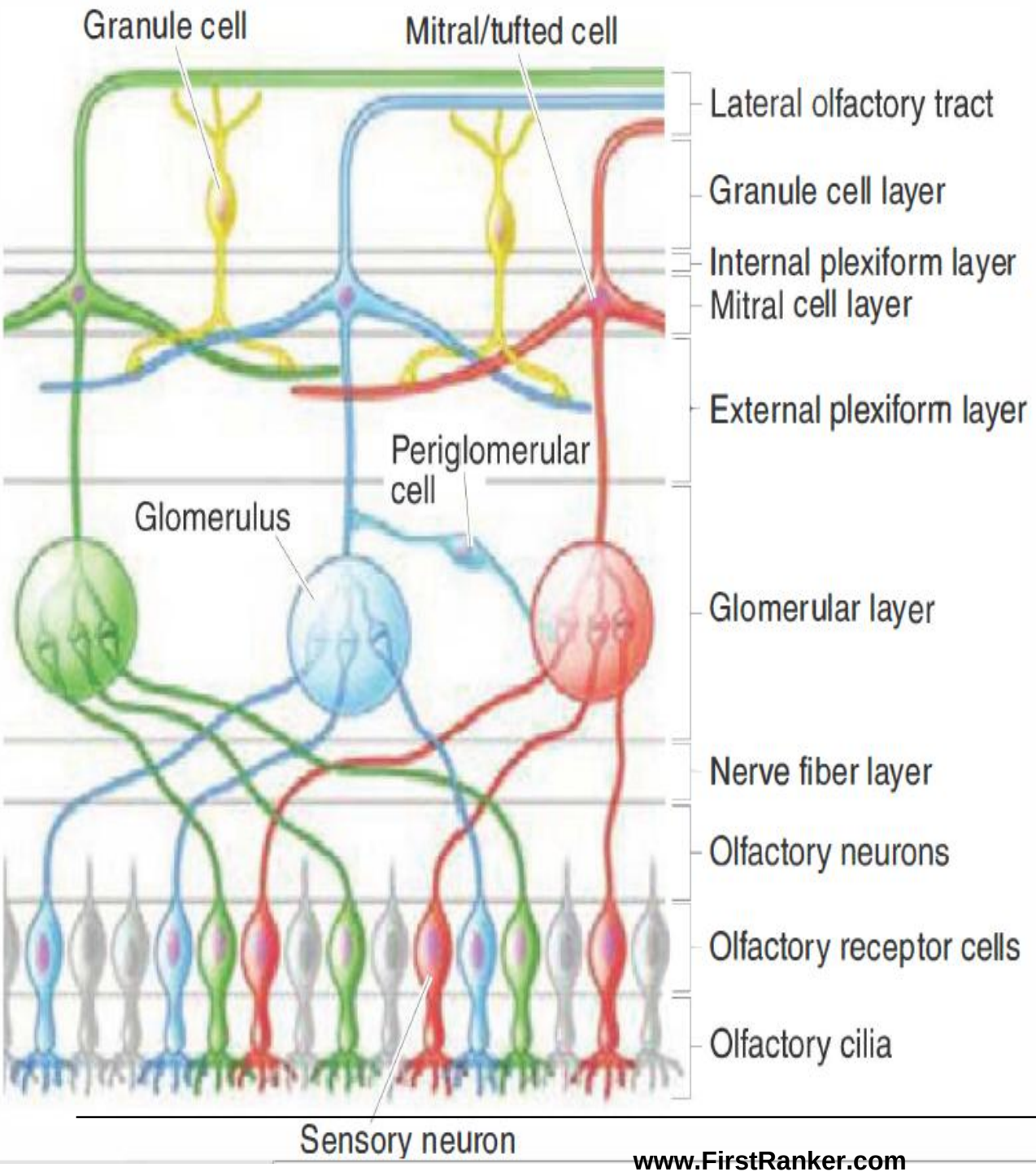
Structure of olfactory epithelium

(ORNs – olfactory receptor neurons)



Peripheral and central components of the primary olfactory pathway



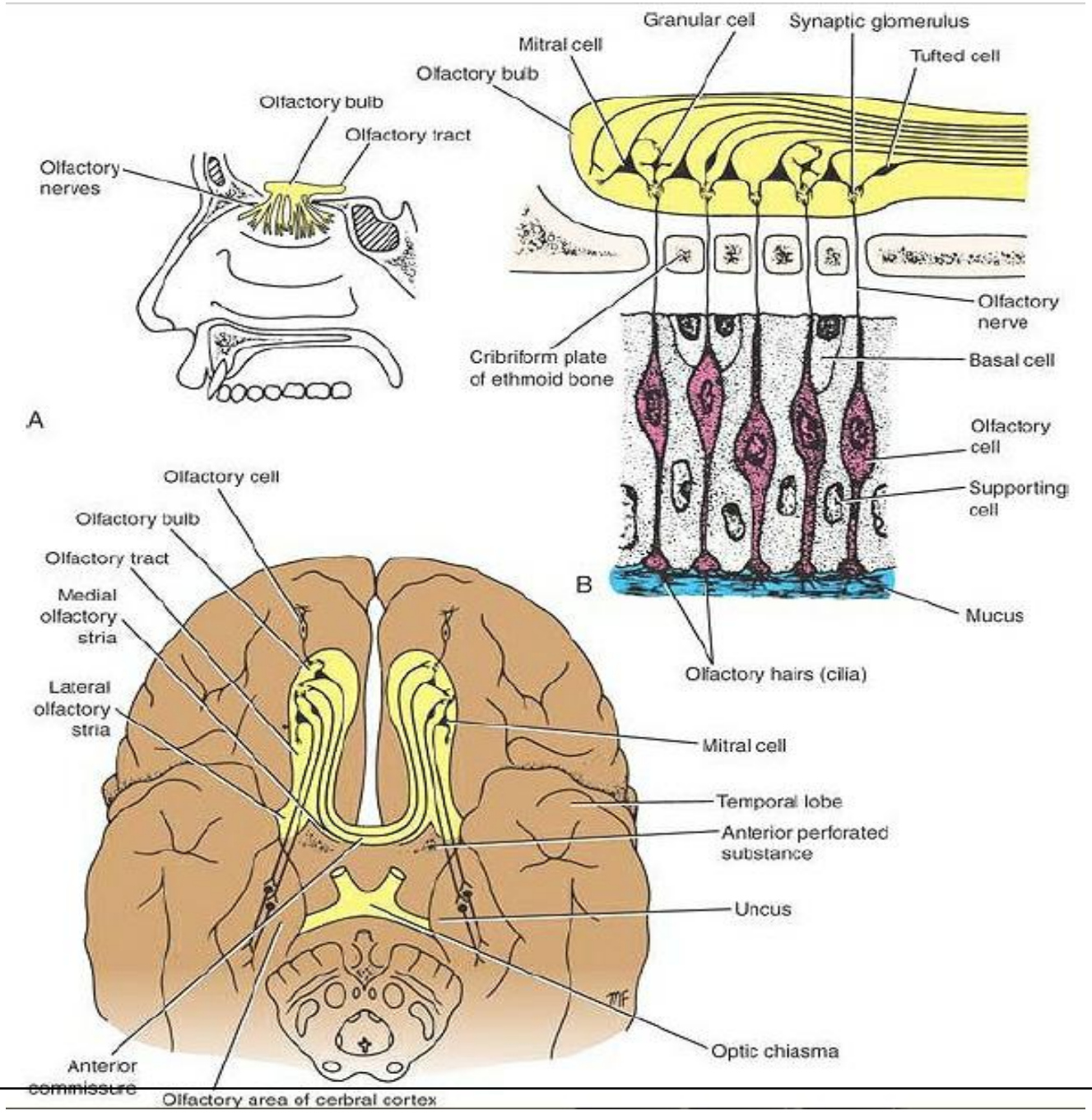


Schematic representation of olfactory bulb .

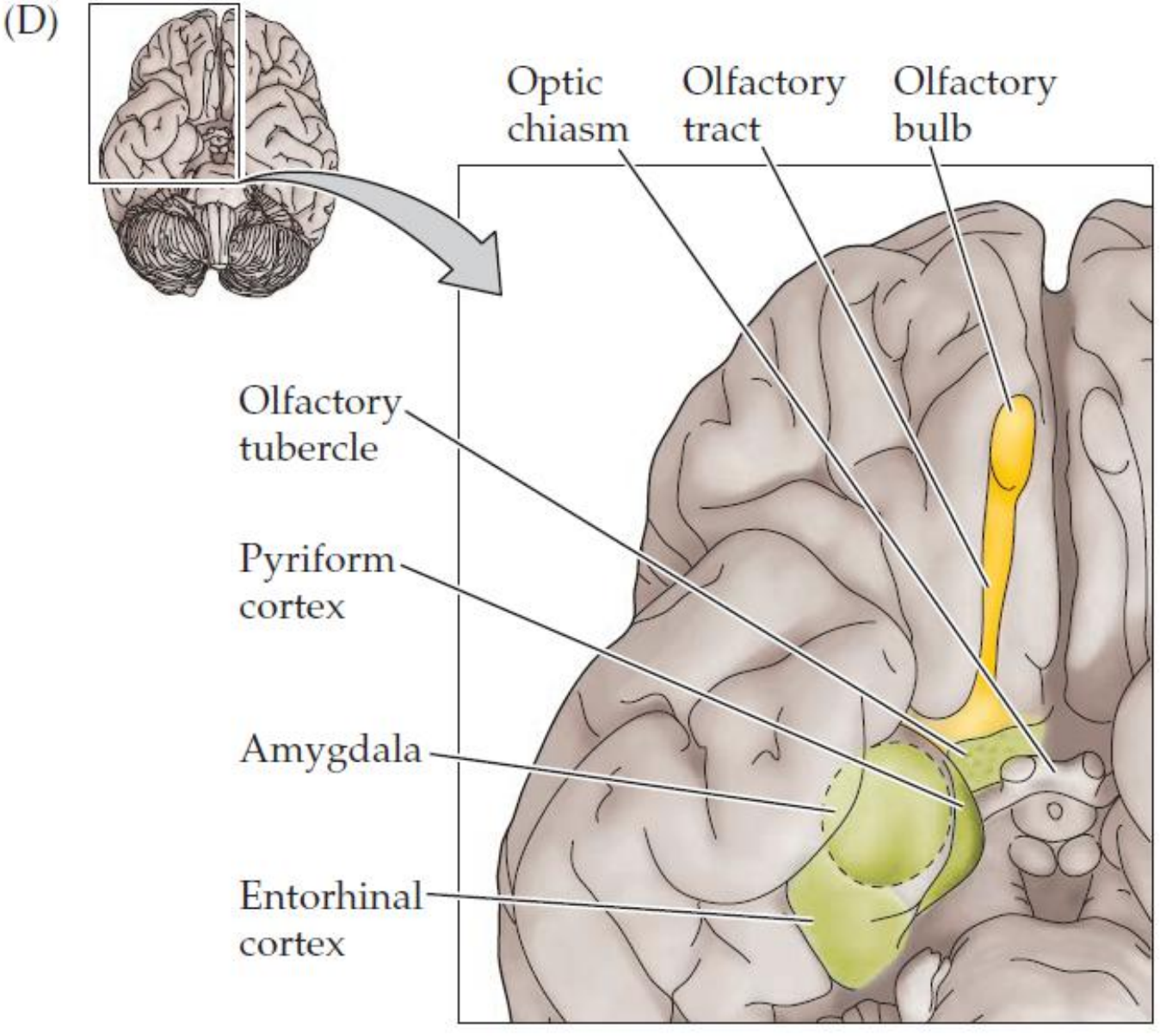
Each receptor type (red, green,blue) projects to a common glomerulus.

The neural activity within each glomerulus is modul-ated by peri glomerular cells.

The activity of the primary projection cells,the mitral and tufted cells, is modulated by granule cells ,periglomerular cells, and secondary dendrites from adjacent mitral and tufted cells



Central components and basic connections of the olfactory system.



The basic pathways for processing olfactory information.