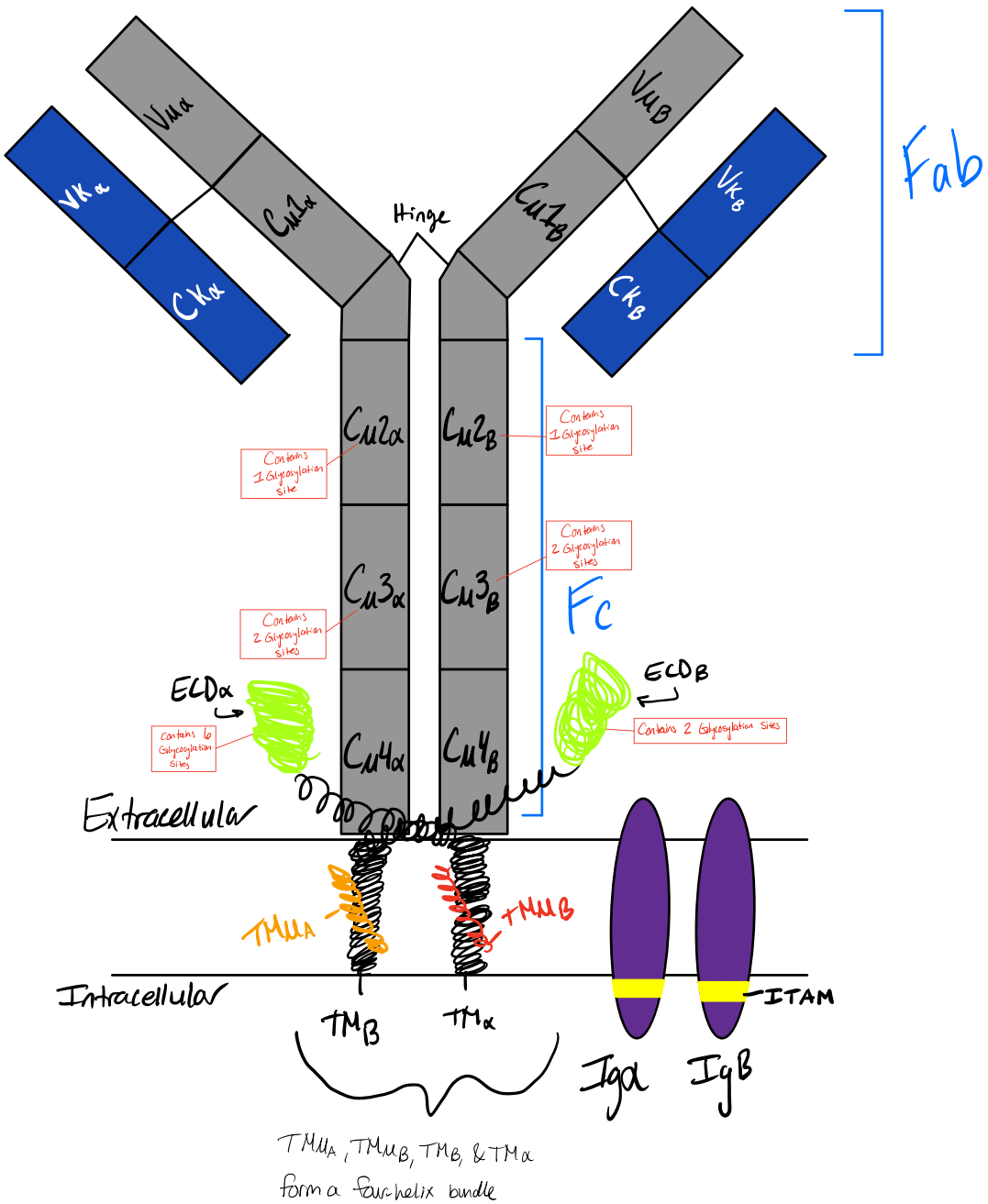
V = Variable

C = Constant

= Heavy Chain

= Light Chain



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BIOL 302

Draw IgM

My drawing showcases the structure of the human Immunoglobulin-B cell receptor (IgM-BCR). The chains that are colored in grey are the heavy chains and the chains colored in dark blue are the light chains. One of the fragment antibodies, or Fab, consists of Vμα, Vκα, Cμ1α, and Cκα. The other Fab consists of Vμβ, Vκβ, Cμ1β, and Cκβ. Everything labeled with a "V" is a variable region and everything labeled with a "C" is a constant region. The first fragment crystallizable (or Fc) portion is made up of Cμ2α, Cμ3α, and Cμ4α. The second Fc is made up of Cμ2β, Cμ3β, and Cμ4β. Cμ2α and Cμ2β both have one glycosylation site, while Cμ3α and Cμ3β both have two glycosylation sites. There are two extracellular domains (ECD) attached to the IgM-BCR; they are ECDα and ECDβ. ECDα contains six glycosylation sites and ECDβ contains two glycosylation sites. The total number of glycosylation sites is 14. There are six components that are membrane spanning domains. They are $TM\mu_A$, $TM\mu_B$, TMα, TMβ, Igα, and Igβ. $TM\mu_A$, $TM\mu_B$, TMα, TMβ form a four-helix bundle in the transmembrane domain. This molecule of IgM (mIgM) differs from soluble IgM (sIgM) in that it is not a pentamer or a hexamer. SIgM has two C-terminal β strands that result in oligomerization. On the other hand, mIgM has two C-terminal α helices ($TM\mu_A$ and $TM\mu_B$) that secure it into the cell membrane. When IgM is attached to the cell membrane (mIgM), it is known as a BCR. When IgM is no longer attached to the cell membrane (sIgM), it is known as an antibody.