

## FIGHT THE INVADER

*This song teaches about the 2 main elements of the Specific Defenses portion of the Immune System. It includes a description of the processes of both cell-mediated and antibody-mediated defenses. Notice that the description of different t-cells and what they do is sung, while the description of all the ways antibodies (produced by B-cells) fight, is rapped, so if you hear it in your head, you'll remember which is which. Also note how color is used to emphasize whether the song is talking about the *recognizing*, *fighting* or *preparing* elements of immunity through specific defenses.*

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### REFRAIN

Recognize the invader  
Fight the invader  
Get ready for the next time

Immunity protects you and me  
From organisms and matter  
That don't mesh, that make a mess  
And leaves our bodies battered

To react or not to react  
That is the first question  
2nd FAQ - How much to react  
It's bad to have over attention

Recognize the invader  
Fight the invader  
Get ready for the next time

Two teams on the same side  
Leading our specific defenses  
T- cell B- antibody  
Mediated for life and senses

T & B cells recognize antigens  
Bound to MHC in cell membrane  
From here the game is different  
Whether on cell or antibody train

T cells must bind a second time  
This is costimulation  
B cells must be sensitized  
Induced by the Helper T-cell nation

Now let the bloodshed begin!

First T  
(note that Memory T cells are a type of cytotoxic T-cells)

### First T

Cytotoxic T-cells find an antigen bound  
and kill physically and chemically  
Helper T-cells link to sensitized B's  
Starting antibody production with ease  
Suppressor T-cells stop the party  
before damage to self is done  
Memory T's divide cytotoxically  
If the invader returns for another run

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### Now B

Activated B cells become plasma cells  
From which the antibodies fly  
Antibodies cause death a number of ways  
They attract others to phagocytize  
Or neutralize by blocking receptor sites  
Or clump invaders and agglutinate  
Some coat to block viruses and bacteria  
Or activate complement & make it inflammate

What happens if invader returns?  
Sensitized B's - memories that last  
So between T & B Memory cells  
A return invader's taken out fast.

Recognize the invader  
Fight the invader  
Get ready for the next time

Recognize the invader: bound to glycoprotein in  
cell membrane — I see you!  
Fight the invader: cell mediated and antibody  
mediated Defenses!  
Get ready for the next time.: Memory cells

Recognize the invader, etc. – repeat and fade