Biology Stack Exchange is a question and answer site for biology researchers, academics, and students. It only takes a minute to sign up.

Sign up to join this community

Anybody can ask a question

Anybody can answer

The best answers are voted up and rise to the top

At what age do babies begin to synthesize their own antibodies?

Asked 8 years ago Active 5 years, 6 months ago Viewed 57k times

16

When babies are first born, they receive their antibodies from their mother (I assume because they do not yet have the capacity to synthesize their own). So my question is, at what age do babies begin synthesizing their own antibodies?

human-biology immunology

2

Share Improve this question Follow

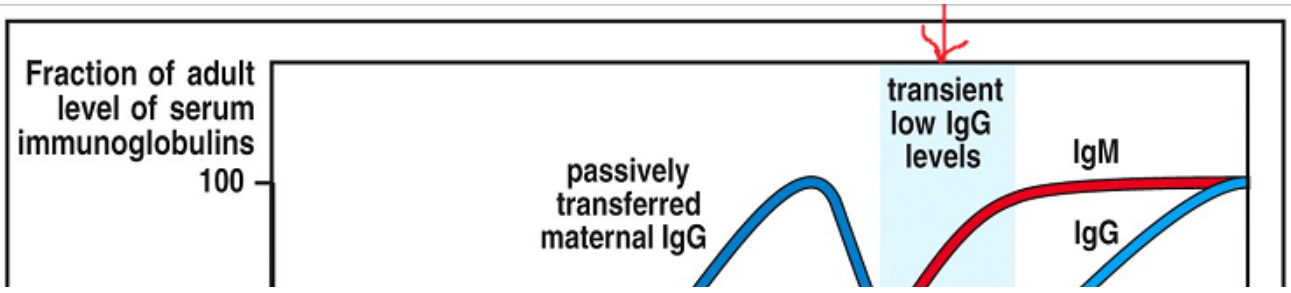
edited Jan 13 '13 at 13:32
kmm
12k 9 54 77

asked Jan 13 '13 at 5:50
Whitney
161 1 1 3

1 Answer

Active | Oldest | Votes

15



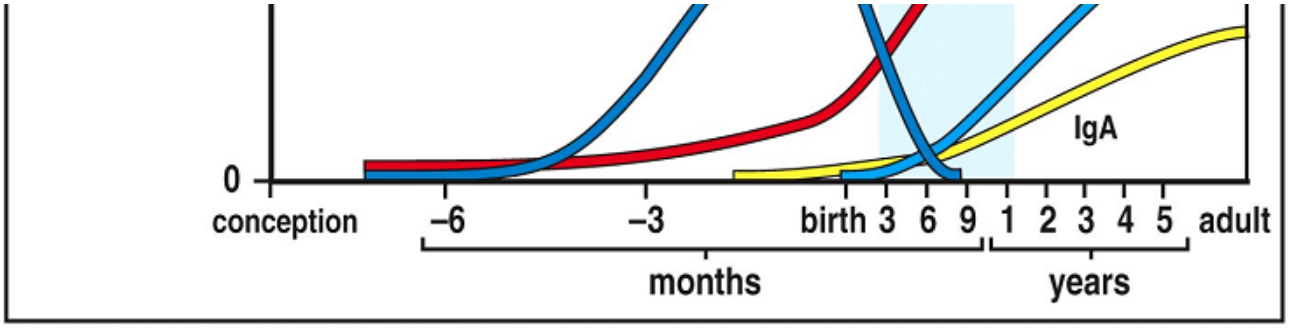


Figure 11-11 Immunobiology, 6/e. (© Garland Science 2005)

In the graph above the darker blue line refers to the antibodies the baby receives from the mother in utero, as you mentioned in your question.

As you can see, the red line indicates that babies begin to produce low levels of their own antibodies between 3 and 6 months before birth. However, these are IgM antibodies, immature 'rough draft' versions. These have much lower affinity for antigens then their mature IgG counterparts which are the classically thought of antibody.

Levels of an infant's own IgG start to rise after birth, however don't reach a reasonable level until after the child is roughly 1 year old. Maternal antibodies start to tail off at around 3 months leaving a period highlighted in blue on the graph where infants are particularly prone to getting infections.

Share Improve this answer Follow

edited Jul 21 '15 at 8:09
Chris ♦
47.2k 13 105 157

answered Jan 13 '13 at 12:31
Rory M
13.4k 9 52 95

2 I don't think that is correct to say that IgMs have lower affinity. When a cell shifts from making an IgM to an IgG via class switching, the variable domains remain the same, there is no change in affinity - affinity maturation has already occurred during proliferation of the IgM-producing cell line. In fact IgM will bind well to weakly cross-reacting antigens because of its high avidity (due to the pentameric structure of the IgM molecule). – Alan Boyd Jan 13 '13 at 15:23

@AlanBoyd this is perhaps a shortcoming in my notes, I was under the impression that affinity maturation has two 'sub-processes', class switch and then somatic hypermutation however I could have easily got the order reversed. – Rory M Jan 13 '13 at 16:37

B cells undergo isotype switching AS WELL AS affinity maturation, under the direction of T cells. So, when a B cell shifts from making IgM to IgG, it is simultaneously altering its antigen binding site in the variable regions to increase the affinity of the antibody being made. Ref: Janeway's Immunobiology – user4938 Nov 17 '13 at 6:53

1 If the fetus gets infected, can it produce antibodies intrauterine to fight the infection ? If yes; is it effective ? Can it be used to test if the infection has traveled from mom to fetus ? – biogirl Apr 16 '15 at 13:08

Highly active question. Earn 10 reputation in order to answer this question. The reputation requirement helps protect this question from spam and non-answer activity.