Reviewer's report

Title: Impairment of circulating endothelial progenitors in Down syndrome

Version: 1 Date: 30 April 2010

Reviewer: Lan Yu

Reviewer's report:

Costa et al investigated a marked decrease of circulating endothelial progenitor cells in young Down syndrome individuals compared to euploid. Cell size and morphological changes were also investigated. SDF-1 alpha plasma levels, which is corresponding to the EPC number, and the expression of its coding gene, CXCL2 and its membrane receptor CXCR4 were also shown a significant decrease in young DS patients. They also demonstrated the progenitor cells are more susceptible to oxidative stress and infection with Bartonella henselae. Microarray analysis confirmed that the differentially expressed genes are grouped into angiogenesis, immune response and inflammation pathways.

The work of this manuscript is huge. The purpose and the methods are standard. However, there are several concerns I would like to be convinced.

Major revisions

1. All the experiments were compared between DS individuals and euploid, it seems to me that all the changes exist only in young DS. The authors should give an age range of those young individuals.

2. In the results of SDF-1 alpha plasma levels, Fig1 D shows that an increase of SDF-1alpha level in age 21-40 patients instead of decrease. Why the authors classified individuals with 20 years? I couldn’t be convinced with 20 or 40 years old as boundaries. What if there are no subgroups? Or the author could discuss more about this result. Hence, there is another question about its coding gene and receptor expression---were they investigated only in 0-20 groups or all of them?

3. Page16 B. Henseale-induced gene expression variations; which MOI was used for this result?

4. In the discussion, the author tried to conclude that the decreased number of EPC may account for the differences in angiogenesis, inflammatory and immune response in DS. From all the data they showed, it is related each other. However, I would like to know more discussion about age (Fig1 D) or timing (Fig3A) effects on cell number or oxidation stress. If all the results (microarray analysis) were investigated in “young” DS, what about the adult or older patients? The author may also investigate it to finding some interesting discovery.

Level of interest: An article of limited interest
Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests