V. CLAIMS

What is claimed is:

1. A method of trafficking NK cells to the bone marrow comprising contacting NK cells with one or more of PM21 particles and FC21 feeder cells.

2. The method of claim 1, wherein method further comprise stimulating the NK cells with IL-2, IL-12, and/or IL-18.

3. The method of claim 1, wherein the contact of the PM21 particles and/or FC21 feeder cells with the NK cells occurs prior to transfer of the NK cells to a patient.

4. The method of claim 1, wherein the contact of the PM21 particles and/or FC21 feeder cells with the NK cells occurs following transfer of the NK cells to a patient.

5. The method of any of claims 1, 3 or 4 wherein the method induces cellular mechanism within NK cells to induce the fucosylation of PSGL-1 on the NK cells surface.

6. The method of any of claims 1, 3 or 4 wherein the method induces expression of FUT7 within NK cells correlating to the fucosylation of PSGL-1 on the NK cells surface.

7. A method of treating a bone marrow malignancy or bone marrow born malignancy in a subject comprising contacting NK cells with PM21 particles and/or FC21 feeder cells and adoptively transferring the NK cells to the subject.

8. A method of treating a viral infection associated with the bone marrow in a subject comprising contacting NK cells with one or more of PM21 particles and FC21 feeder cells and adoptively transferring the NK cells to the subject.

9. The method of claim 7 or 8, wherein the contact of the PM21 particles and/or FC21 feeder cells with the NK cells occurs prior to transfer of the NK cells to a patient.

10. The method of claim 7 or 8, wherein the contact of the PM21 particles and/or FC21 feeder cells with the NK cells occurs following transfer of the NK cells to a patient.