CLAIMS

1. A method of distinguishing and isolating a cardiomyocyte sub-type population from a heterogeneous population of mature cardiomyocytes that were differentiated from human pluripotent stem cells in a sample, the method comprising:

(a) contacting the sample with a first agent that specifically binds to a cell surface marker selected from the group consisting of JAK2 and CD200 to provide a first population of ventricular cardiomyocytes, and/or a second agent that specifically binds to CHRND to provide a second population of atrial cardiomyocytes; and

(b) isolating the cells bound to the said agents,

wherein each of the first and second agents is coupled with a binding agent against SIRPA.

2. The method according to any one of the preceding claims, wherein the method further comprises the step of, prior to isolating the cardiomyocyte population, generating a culture of human pluripotent stem cells and causing differentiation of the human pluripotent stem cells into the heterogeneous population of mature cardiomyocytes in the sample.

3. The method according to any one of the preceding claims, wherein the binding agent is an antibody or a fragment thereof.

4. The method according to claim 3, wherein the antibody is labelled with a detectable moiety.

5. The method according to claim 4, wherein the detectable moiety is selected from the group consisting of: a fluorescent moiety, a luminescent moiety, a chemiluminescent moiety, a radioactive moiety, an enzymatic moiety and a secondary antibody.

6. The method according to any one of the preceding claims, wherein the isolated cells comprise a population of cells having at least 85% purity.

7. The method according to any one of the preceding claims, wherein the cardiomyocyte population is isolated using fluorescent activated cell sorting.

8. The method according to any one of the preceding claims, wherein the human pluripotent stem cells are ES03 cells and/or BJ iPS cells.