CLAIMS

1. A method of differentiating stem cells into specialized cells, comprising:

coating a surface of a substrate with two-dimensional amorphous carbon (2DAC);

disposing a seed layer on the surface of the substrate coated with 2DAC; and

adsorbing growth factors in a stem cell medium onto the surface of the substrate coated with 2DAC.

2. The method of claim 1, comprising:

growing additional stem cells from the seed layer until a desired concentration of the stem cells is reached.

3. The method of claim 1, wherein the growth factors are adsorbed onto the surface of the substrate coated with 2DAC at a faster rate than compared to standard tissue culture substrates.