Surface Area to Volume Practical

Aim: To demonstrate the relationship between surface area to volume ratio and the movement of substances in and out of cells.

Equipment: potato, cutting board; ruler; iodine solution; 250mL beaker; timer

Method

1. Cut potato into the following cubes: 2mm; 5mm and 10mm.
2. Place into 250mL beaker and cover with iodine solution
3. Leave for 1minute
4. Cut cubes in half and measure the distance that the iodine solution has moved into the cube. Record the results in a table.
5. Repeat steps 1to 4 and leave for in the iodine solution for 2, 5 and 10 minutes.

Risk Assessment:

|  |  |
| --- | --- |
| Risk | Mitigation |
| Cuts from scalpels  Staining from iodine  Toxicity of iodine | Handle scalpels carefully.  Pickup by the handle  Lay flat on the workbench  Wear gloves  Wear safety glasses  Keep hands away from face  Wash hands after practical |

Results:

Discussion:

Surface area to volume ratios:

The surface area to volume ratio for the 2mm cube is:

Surface area = 2 x 2 x 6 = 24mm2

Volume = 2 x 2 x 2 = 8mm3

Surface area to volume ratio = 24 : 8 = 3: 1

The surface area to volume ratio for the 5mm cube is:

Surface area = 5 x 5 x 6 = 150mm2

Volume = 5 x 5 x 5 = 125mm3

Surface area to volume ratio = 150 : 125 = 1.2: 1

The surface area to volume ratio for the 10mm cube is:

Surface area = 10 x 10 x 6 = 600mm2

Volume = 10x 10 x 10 = 1000mm3

Surface area to volume ratio = 600 : 1000 = 0.6 : 1