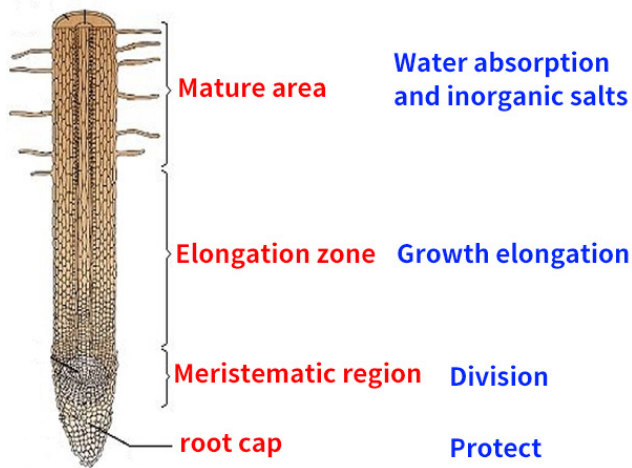


Tips for Experimental Design

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Why use the root maturation zone as the $Cd^{2+}/Cu^{2+}/Pb^{2+}$ detection site



1. The maturation zone is the main site for the stable absorption of heavy metals

2. Why it is not recommended to choose the root zone with the largest absorption rate as the detection site

1) According to the statistics of experimental data, the rate of absorption of heavy metal ions in the meristematic zone and elongation zone is generally greater than that in the maturation zone.

2) Taking rice as an example, on a root, the meristematic zone and elongation zone account for less than 1% of the total root length.

3) If the meristematic area with the highest absorption rate is used as the fixed-point detection site, and the Cd^{2+} absorption rate of the meristematic area of Group A is measured to be greater than that of Group B, can it be said that the rate of Cd^{2+} absorption of Group A is greater than that of Group B? No, because the total length of the meristematic zone is 300-500 μm , no matter how

high the absorption rate is, the influence on the Cd^{2+} content of the whole root is minimal.

4) Therefore, the Cd^{2+} uptake rate in the maturation area best represents the Cd^{2+} uptake in the whole root.

3. If the maturation area is measured, at which point should it be set?

According to the statistics of different materials, 99% of the points from 2500 μm away from the apex are typical maturation areas, and all the detected positions greater than 2500 μm away from the apex are in the maturation area. If the total root length is greater than 1cm, it is recommended to choose a position of 5000 μm .

4. Is it necessary to scan to detect the absorption rate of $Cd^{2+}/Cu^{2+}/Pb^{2+}$ on the root surface?

According to the above analysis, for the root-surface heavy metal absorption experiment, point sweeping is not necessary.

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