# Article information:

Uptake and cellular distribution, in four plant species, of fluorescently labeled mesoporous silica nanoparticles | SpringerLink
[https://link.springer.com/article/10.1007/s00299-014-1624-5?utm\_source=xmol=affiliate=meta=DDCN\_1\_GL01\_metadata](https://link.springer.com/article/10.1007/s00299-014-1624-5?utm_source=xmol&utm_medium=affiliate&utm_content=meta&utm_campaign=DDCN_1_GL01_metadata)

# Article summary:

1. Mesoporous silica nanoparticles (MSNs) of optimal size and configuration were synthesized for uptake by plant organs, tissues and cells.

2. A combination of confocal laser scanning microscopy, transmission electron microscopy and proton-induced X-ray emission (micro-PIXE) elemental analysis allowed the location and quantification MSNs in tissues and in cellular and sub-cellular locations.

3. MSNs penetrated into the roots via symplastic and apoplastic pathways and then via the conducting tissues of the xylem to the aerial parts of the plants including the stems and leaves.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article is generally reliable, as it provides a comprehensive overview of mesoporous silica nanoparticles (MSNs) uptake by four plant species, their movement to aerial parts, as well as their quantification using fluorescence, TEM and proton-induced x-ray emission (micro-PIXE). The authors provide evidence for their claims through a combination of confocal laser scanning microscopy, transmission electron microscopy and proton-induced X-ray emission (micro-PIXE) elemental analysis. Furthermore, they discuss potential risks associated with MSN uptake by plants such as seed germination or negative effects on different organs.

However, there are some points that could be further explored in order to make this article more trustworthy. For example, while the authors mention that MSNs have been used for drug delivery in animal models, they do not provide any evidence or discussion on how this could be applied to plants. Additionally, while they discuss potential risks associated with MSN uptake by plants such as seed germination or negative effects on different organs, they do not provide any evidence or discussion on possible long term effects of MSN uptake by plants. Finally, while they discuss potential applications of MSNs in plants such as delivery systems for biomolecules into plants, they do not provide any evidence or discussion on how this could be achieved in practice.

In conclusion, while this article is generally reliable due to its comprehensive overview of mesoporous silica nanoparticles (MSNs) uptake by four plant species and their quantification using fluorescence, TEM and proton-induced x-ray emission (micro-PIXE), there are some points that could be further explored in order to make it more trustworthy such as providing evidence for potential applications of MSNs in plants or discussing possible long term effects of MSN uptake by plants.

# Topics for further research:

* Mesoporous silica nanoparticles drug delivery in plants
* Long-term effects of MSN uptake by plants
* Biomolecule delivery systems in plants
* Confocal laser scanning microscopy for MSN uptake
* Transmission electron microscopy for MSN uptake
* Proton-induced X-ray emission for MSN quantification

# Report location:

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