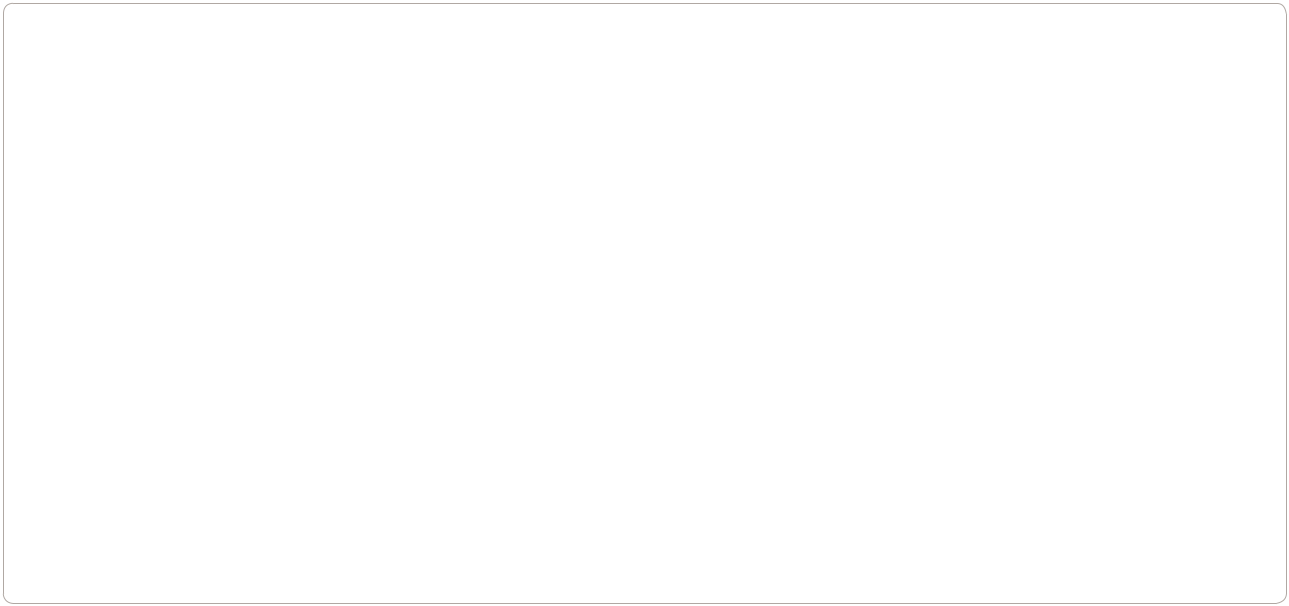
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| *et al. J Nanobiotechnol* | *(2* |

Journal of Nanobiotechnology



*Oryza sativa*



*Oryza sativa*

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***Experiment 1. Whether plants can uptake SeNPs?***

***Experiment 3. Comparison of uptake and transformation between SeNPs and inorganic Se in plants***

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***Experiment 2. How SeNPs is taken up by plants?***

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|  |  |  | TROOT −SE , TRICE−SE ) | (SHOOT − SE%, |  |
| ° |  |  | ROOT − SE%, SHOOTF 1/F 2/F 3 − SE%, ROOTF 1/F 2/F 3 − SE% | |  |
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| ° |  |  | TShoot−Se = CShoot−Se × BiomassShoot | |  |
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|  |  |  | TRoot−Se = CRoot−Se × BiomassRoot | |  |
| – |  |  | TRice−Se = TShoot−Se | + TRoot−Se |  |
|  |  |  | Se uptake = TRice−Se / BiomassRoot | |  |
|  |  |  | Shoot − Se% = TShoot−Se / TRice−Se × 100% | |  |
|  | × × μ |  | Root − Se% = (TRoot−Se / TRice−Se) × 100% | |  |
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| ShootF 1/F 2/F 3−Se% = CShootF 1/F 2/F 3−Se / CShootF 1−Se + CShootF 2−Se + CShootF 3−Se × 100% | | | | |  |
| RootF 1/F 2/F 3−Se% = CRootF 1/F 2/F 3−Se / (CRootF 1−Se + CRootF 2−Se + CRootF 3−Se) × 100% | | | | |  |
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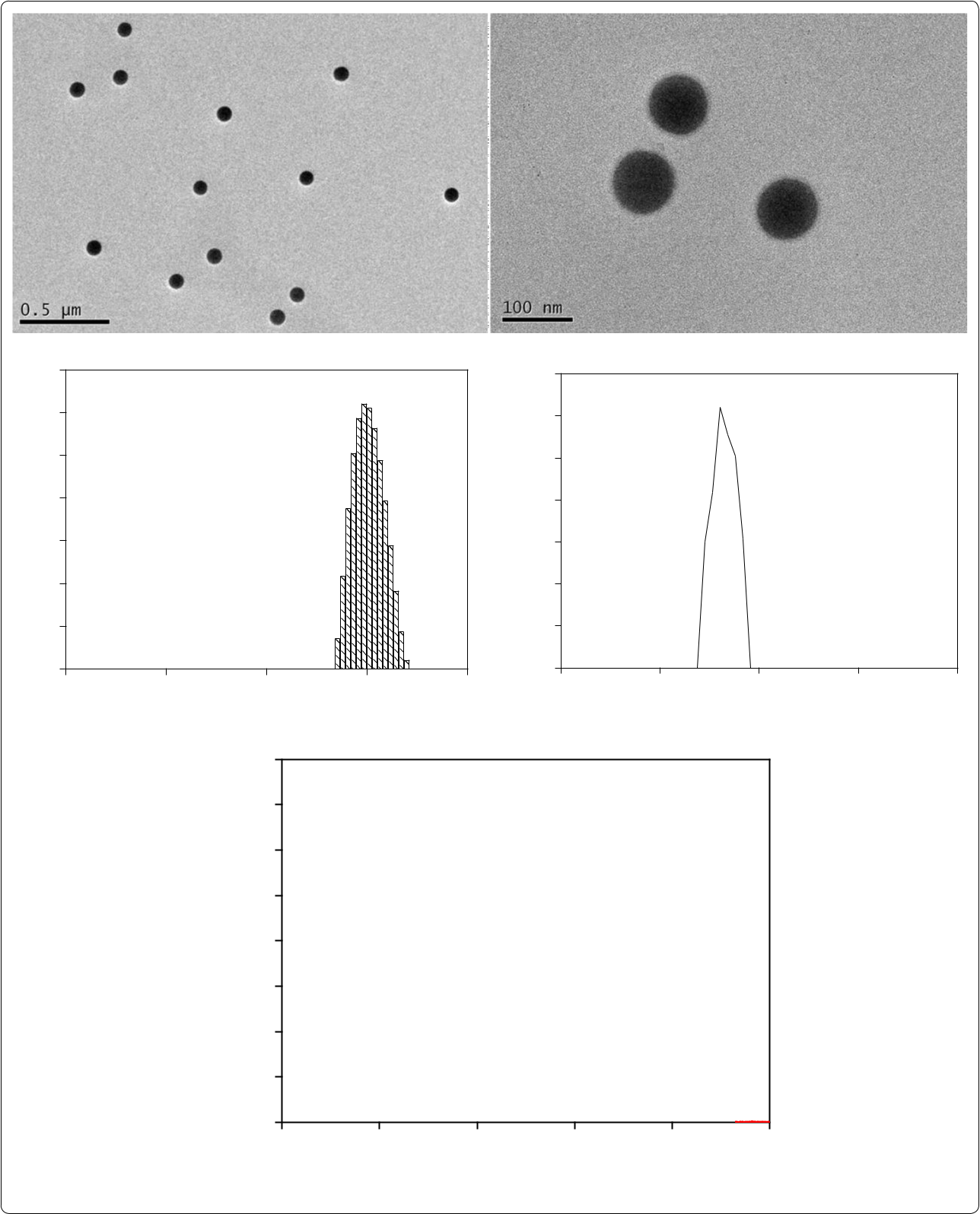
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Exposure time (h)

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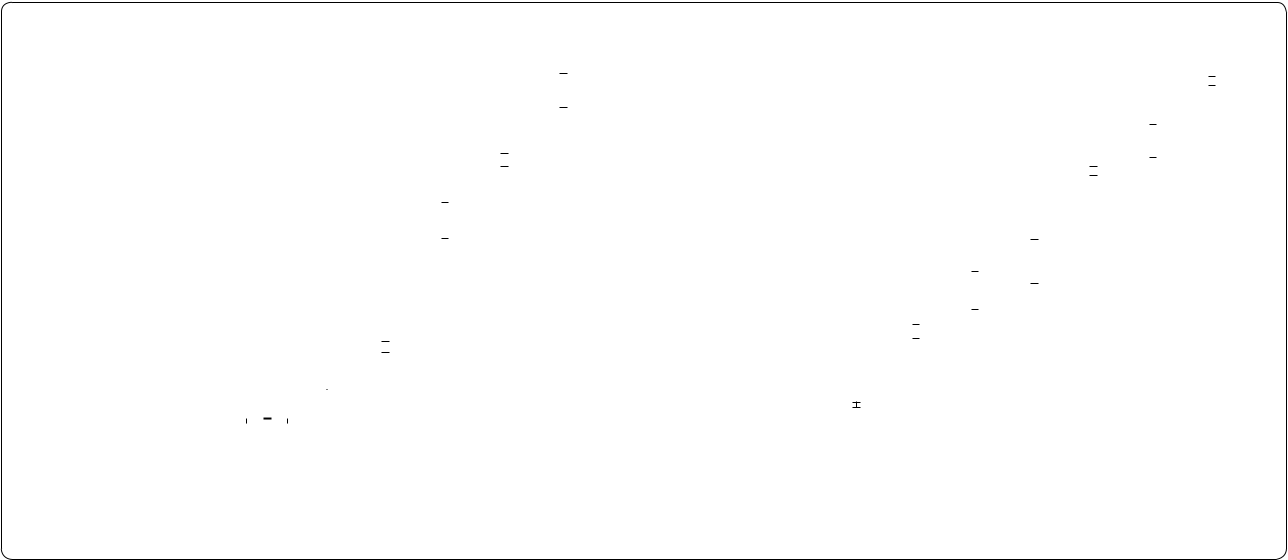
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Exposure time (h)

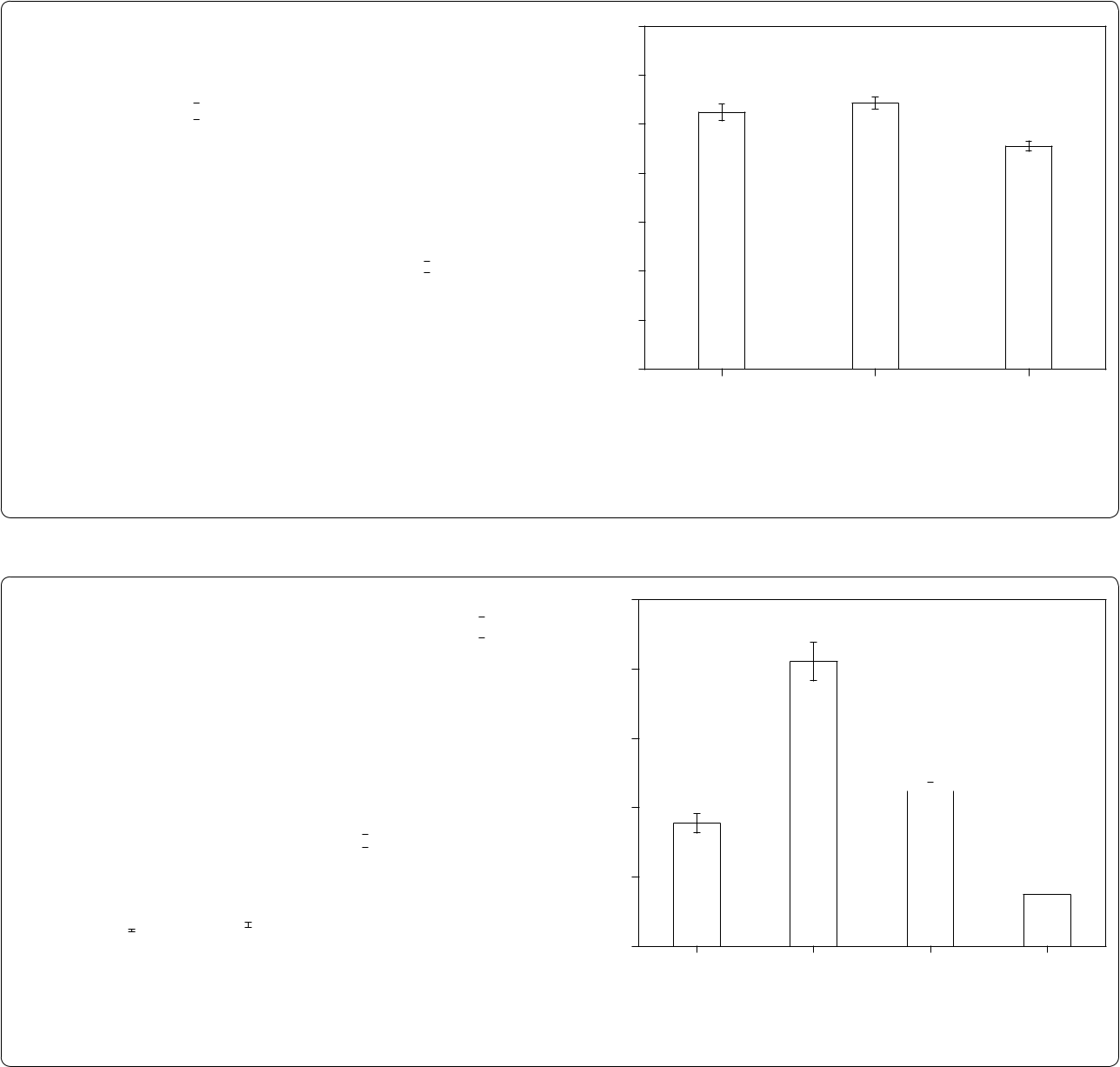
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|  | 0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | 10 M SeNPs 30 M SeNPs | | | | | | | | | | | | 10 M selenite | | | | | |  |  | 10 M selenate | | | | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  | Treatments | | | | | | | |  |  |  |  |  |  |  |  |
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| Se influx ( g g-1 root h-1 DW) |



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| Se content in roots (g g-1 FW) |

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1.0

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40

30

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0

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**b**

a a

b

SeNPs SeNPs + Ethanol SeNPs + CCCP

Treatments

**b** a

b

b

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10 M SeNPs 30 M SeNPs 10 M selenite 10 M selenate

Treatments

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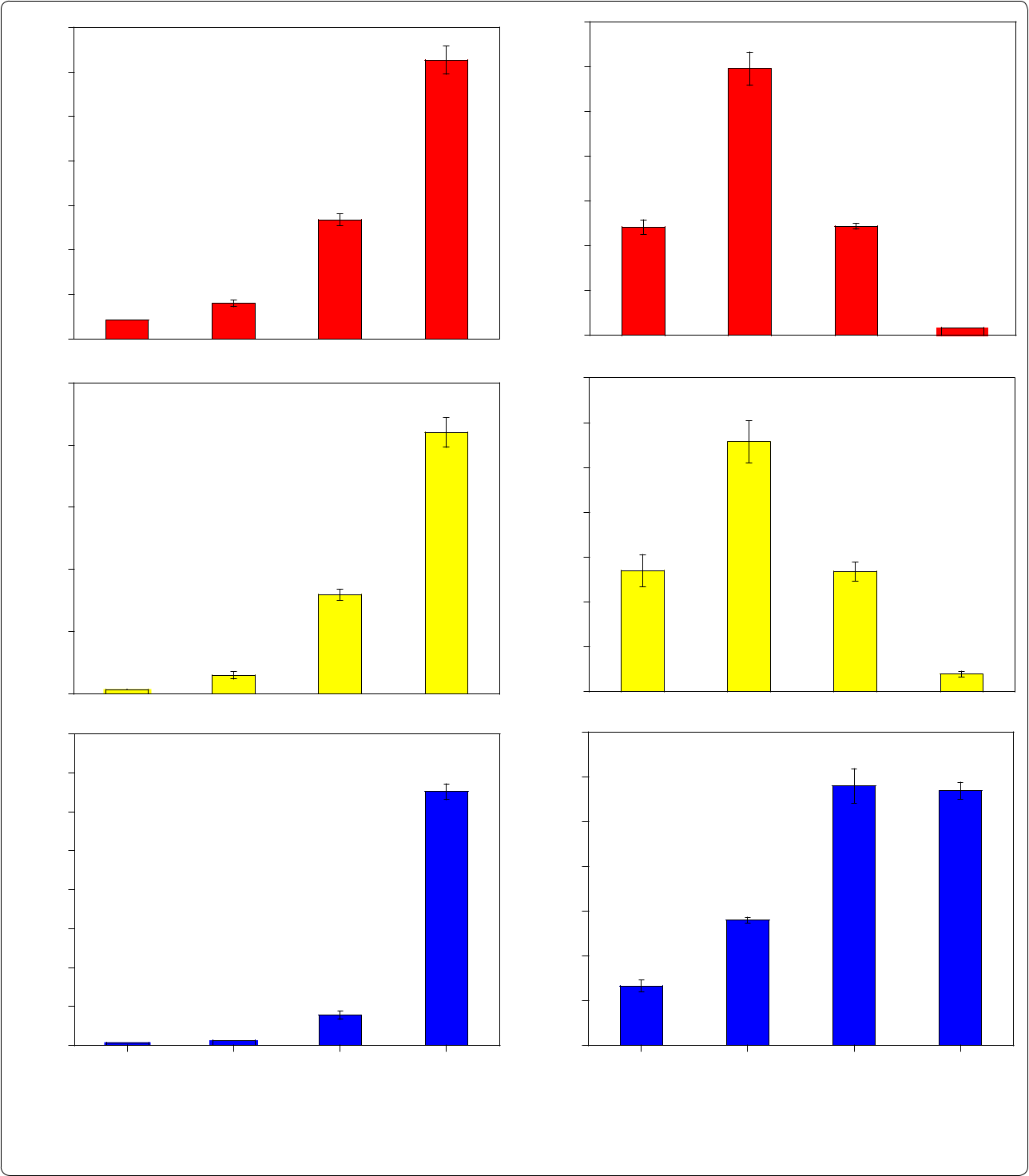
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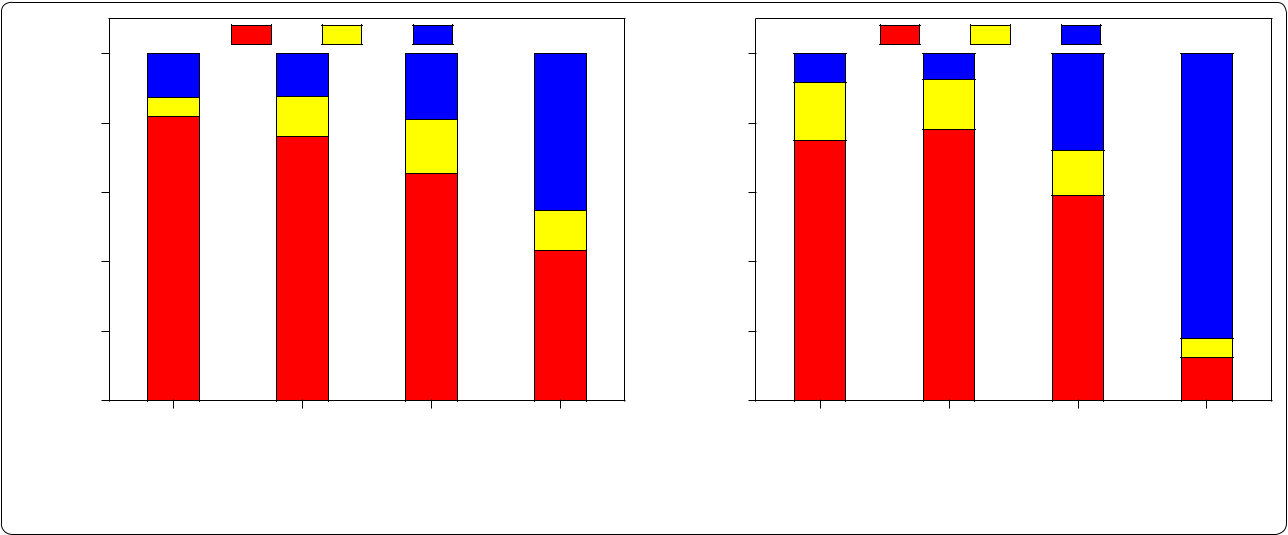
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| \*et al. J Nanobiotechnol* | | | *(2* |  |  |  |  |  |  |  | P |  |
| FW) | 3.5 | **a** F1 |  |  | a | FW) | 35 | **d** F1 | a |  |  |  |
| 3.0 |  |  |  |  | 30 |  |  |  |  |  |
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| -1 | 2.5 |  |  |  |  | -1 | 25 |  |  |  |  |  |
| g |  |  |  |  | g |  |  |  |  |  |
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| Secontentinshoots | 2.0 |  |  |  |  | Secontentinroots | 20 |  |  |  |  |  |
| 1.5 |  |  | b |  | 15 | b |  | b |  |  |
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| FW) | 1.0 | **b** F2 |  |  | a | FW) | 7 | **e** F2 | a |  |  |  |
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| 0.8 |  |  |  |  |  |  |  |  |  |  |
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| g |  |  |  |  |  | g |  |  |  |  |  |
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| Secontentinshoots |  |  |  |  | Secontentinroots | 4 |  |  |  |  |  |
| 0.2 |  |  |  |  |  |  |  |  |  |
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|  | 0.4 |  |  |  |  |  |  |  |  |  |
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|  | 0.0 |  |  |  |  | 0 |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| FW) | 4.0 | **c** F3 |  |  | a |  | 7 | **f** F3 |  | a | a |  |
| 3.5 |  |  |  | FW) | 6 |  |  |  |
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|  | 10 M SeNPs | 30 M SeNPs | 10 M selenite | 10 M selenate |  | 10 M SeNPs | 30 M SeNPs | 10 M selenite | 10 M selenate |  |
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| **.** |  |  |  |  |  | ± = | |  |  |  |  |  |
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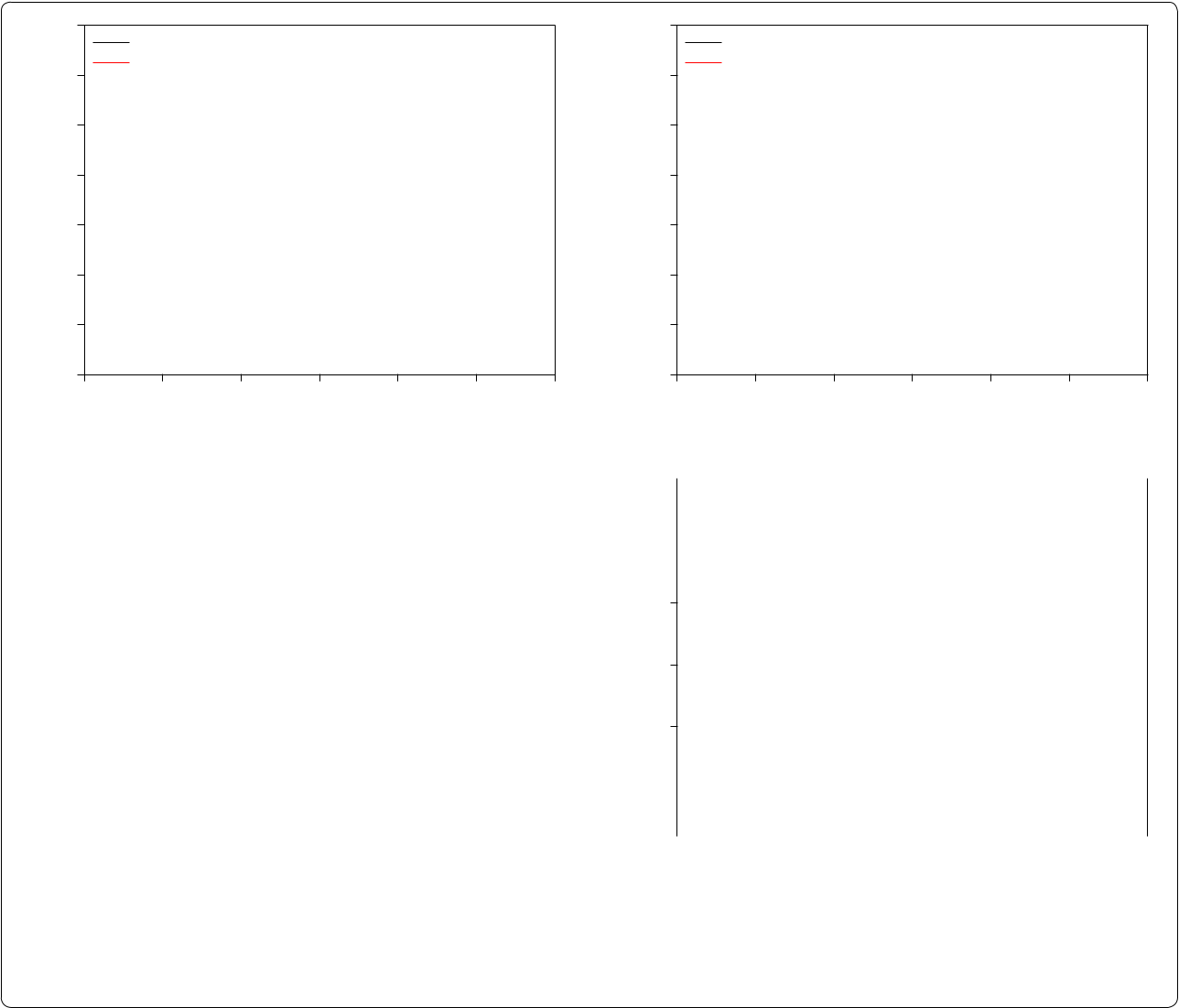


μ −

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|  |  | 100 | **a** |  |  | F1 |  | F2 | F3 |  |  |  |  | 100 | **b** |  |  | F1 | F2 | F3 |  |  |  |
| DistributionofSeindifferent | subcellularfractions(%) |  |  |  |  |  |  |  |  | DistributionofSeindifferent | subcellularfractions(%) |  |  |  |  |  |  |  |  |
| 80 |  |  |  |  |  |  |  |  |  | 80 |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | 60 |  |  |  |  |  |  |  |  |  |  |  | 60 |  |  |  |  |  |  |  |  |  |
|  |  | 40 |  |  |  |  |  |  |  |  |  |  |  | 40 |  |  |  |  |  |  |  |  |  |
|  |  | 20 |  |  |  |  |  |  |  |  |  |  |  | 20 |  |  |  |  |  |  |  |  |  |
|  |  | 0 | 10 M SeNPs | | | 30 M SeNPs | | 10 M selenite | | 10 M selenate | |  |  | 0 | 10 M SeNPs | | 30 M SeNPs | | 10 M selenite | | 10 M selenate | |  |
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| **.** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 400 | | Shoots | |  |  |  |  |  |  | **a** |  | 400 | | Shoots | |  |  |  |  |  | **b** |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 350 | | Roots | |  |  |  |  |  |  |  |  | 350 | | Roots | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| (mV) | 300 | |  |  |  |  |  |  |  |  |  | (mV) | 300 | |  |  |  |  |  |  |  |  |  |
| 250 | |  |  |  |  |  |  |  |  |  | 250 | |  |  |  |  |  |  |  |  |  |
| Signal |  |  |  |  |  |  |  |  |  | Signal |  |  |  |  |  |  |  |  |  |
| 200 | |  |  |  |  |  |  |  |  |  | 200 | |  |  | 5 |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 150 | | 2 | 3 | 4 |  |  |  |  |  |  |  | 150 | |  | 4 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 100 | |  |  |  |  |  |  |  |  |  |  | 100 | |  |  |  |  |  |  |  |  |  |
|  |  | 50 |  |  |  |  |  |  |  |  |  |  |  | 50 |  |  |  |  |  |  |  |  |  |
|  |  | 0 | 200 | |  | 400 | 600 |  | 800 | 1000 | 1200 |  |  | 0 | 200 | | 400 | 600 |  | 800 | 1000 | 1200 |  |



Retention time (s) Retention time (s)

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| Signal (mV) |

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| 500 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | Shoots | | | |  |  |  |  |  |  |  |  |  |  |  |  | **c** |  |  |
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| 400 |  |  |  | Roots | | | | 5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 300 |  |  |  |  | 2 |  |  | 4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  | 0 | |  |  | 200 | | | 400 | | | 600 | | | 800 | | | 1000 | | | 1200 | |  |

Retention time (s)

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| Signal (mV) |

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|  |  |  | Shoots | **d** |  |
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| 750 |  |  |  | Roots | 8 |  |
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| 0 | | | | 200 | | | 400 | | | 600 | | | 800 | | | 1000 | | | 1200 | |  |

Retention time (s)

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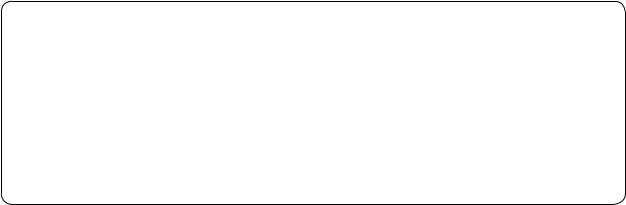
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*SeCys* *2MeSeCys*

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*Oryza sativa*

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*Phaseolus aureus*

*Nicotiana tabacum*

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*Triticum aestivum*

*Oryza sativa*

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*Oryza sativa*

*Oryza sativa*

*Brassica chinensis*

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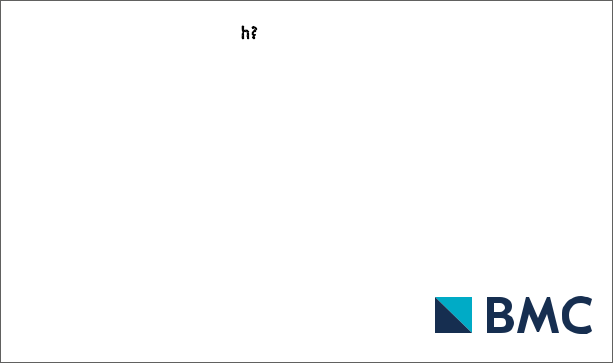
*Brassica juncea*

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*salmonella Raphanus sativus typhimurium*

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