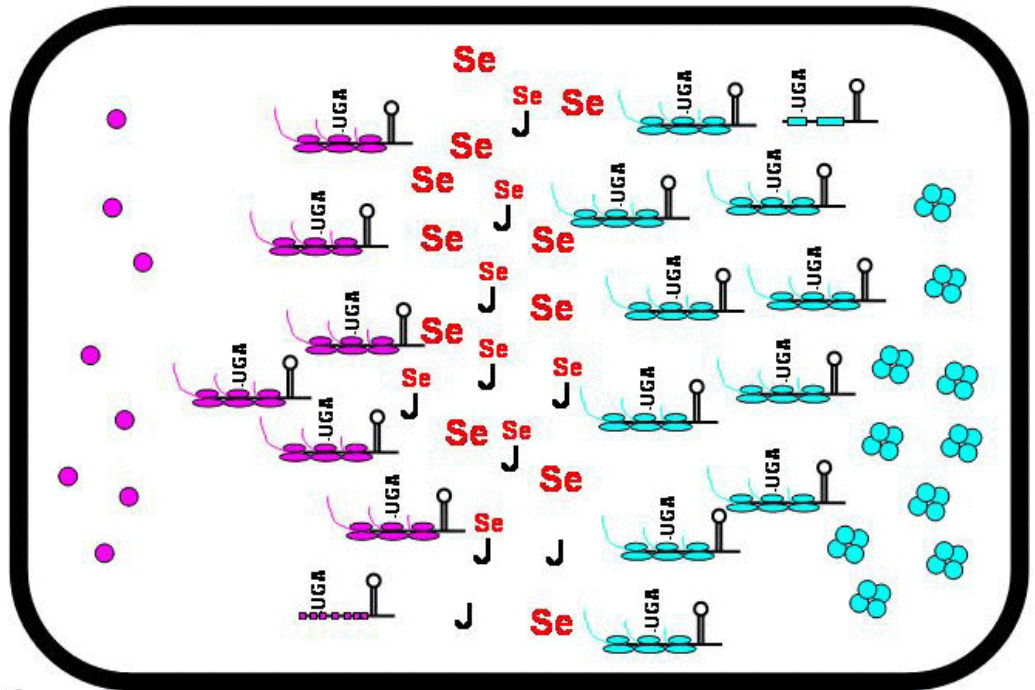


Se-Adequate Cell

Top: The top cell shows the relevant components for selenium regulation of GPX1 and GPX4 in a Se-adequate cell. Assume that these are liver cells similar to what was observed in rat liver. The key below indicates what each symbol represents. Note that the relative ratio between components (eg. number of GPX1 mRNAs vrs. GPX1 proteins) are not accurate.



Selenium Regulation

Component Symbol

Se: **Se**

Apo-tRNA_{UGA}: **J**

Sec-tRNA_{UGA}: **J**

GPX1 mRNA: **J**

Translating GPX1 mRNA: **J**

GPX4 mRNA: **J**

Translating GPX4 mRNA: **J**

GPX1: **GPX1**

GPX4: **GPX4**

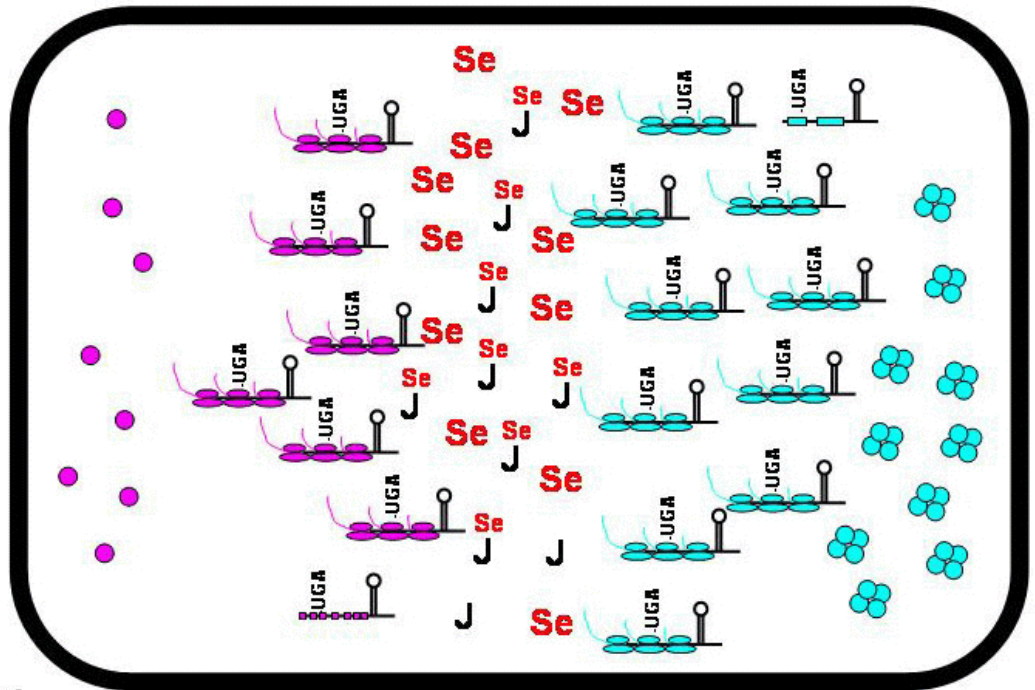
Se-Deficient Cell



Exercise: Using information presented in class and in the assigned readings, draw the relevant components in a selenium-deficient cell. The relative number of components should reflect the change from Se-adequate to Se-deficient (eg. there should be far fewer Se atoms in the Se-deficient cell). On an attached page, explain briefly and justify the number of each component in the Se-deficient cell vrs. the Se-adequate cell.

Se-Adequate Cell

Top: The top cell shows the relevant components for selenium regulation of GPX1 and GPX4 in a Se-adequate cell. Assume that these are liver cells similar to what was observed in rat liver. The key below indicates what each symbol represents. Note that the relative ratio between components (eg. number of GPX1 mRNAs vrs. GPX1 proteins) are not accurate.



Selenium Regulation

Component Symbol

Se: Se

Apo-tRNA_{uga}: J

Sec-tRNA_{uga}: J^{Se}

GPX1 mRNA:

Translating GPX1 mRNA:

GPX4 mRNA:

Translating GPX4 mRNA:

GPX1:

GPX4:

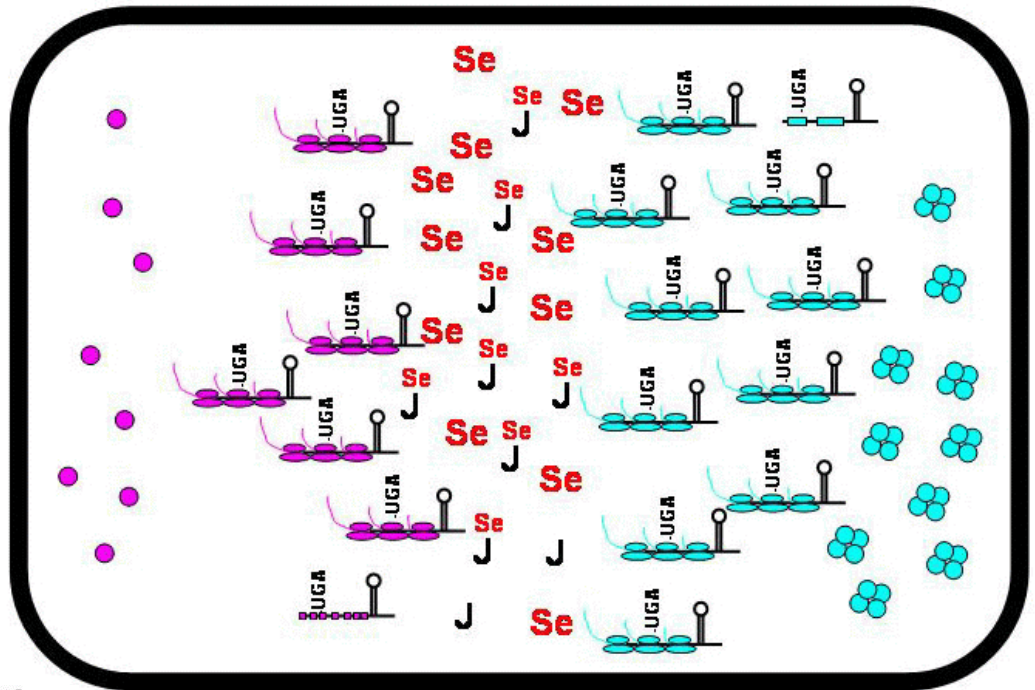
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Selenium Regulation

Component Symbol

Se: **Se**

Apo-tRNA_{uga}: **J**

Sec-tRNA_{uga}: **J** **Se**

GPX1 mRNA:

Translating GPX1 mRNA:

GPX4 mRNA:

Translating GPX4 mRNA:

GPX1:

GPX4:

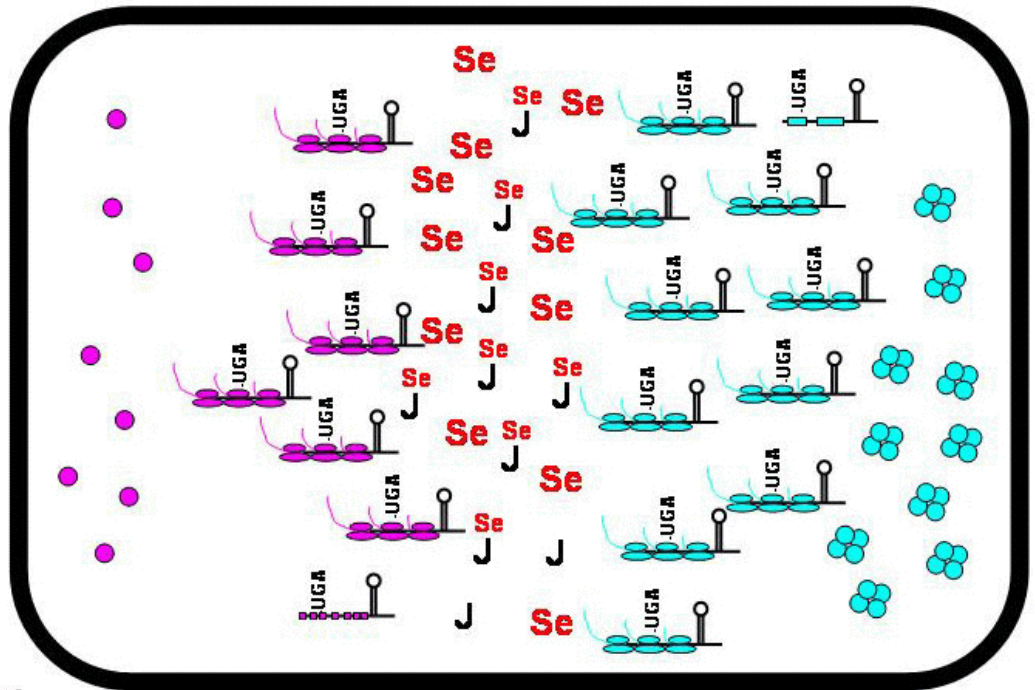
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Selenium Regulation

Component Symbol

Se: Se

Apo-tRNA_{uga}: J

Sec-tRNA_{uga}: J^{Se}

GPX1 mRNA:

Translating GPX1 mRNA:

GPX4 mRNA:

Translating GPX4 mRNA:

GPX1:

GPX4:

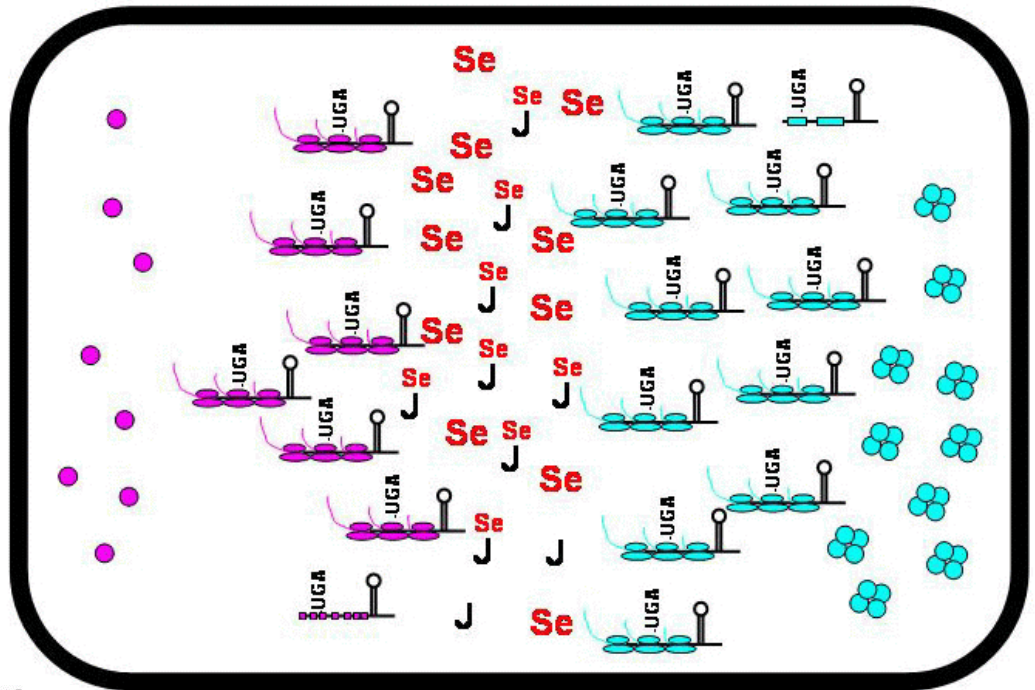
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Se: **Se**

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GPX4 mRNA: **J**

Translating GPX4 mRNA: **J**

GPX1: **GPX1**

GPX4: **GPX4**

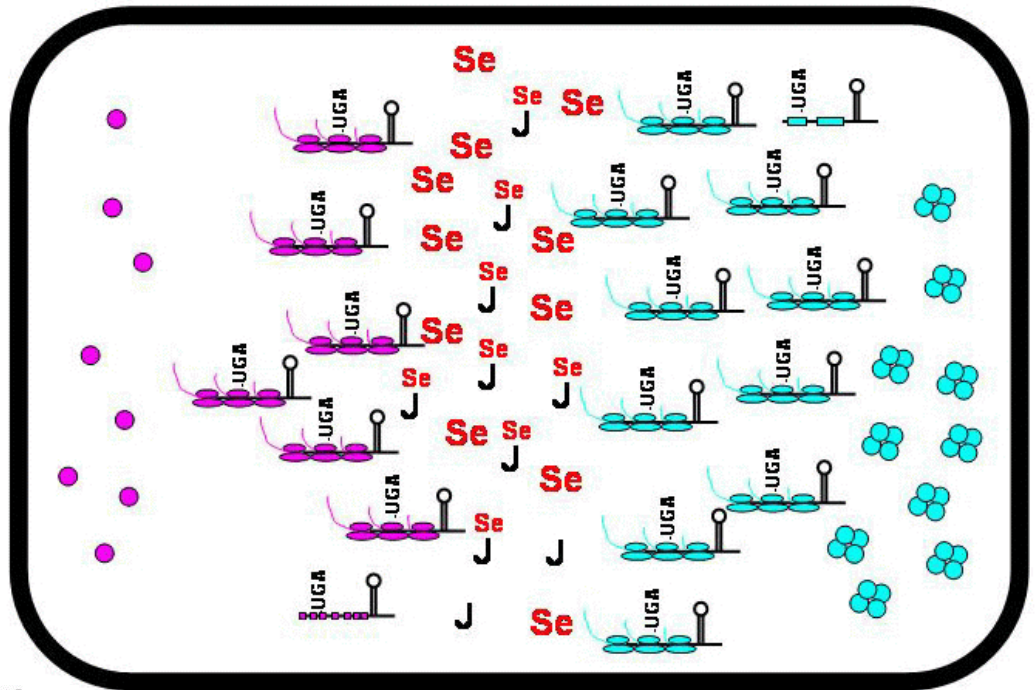
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Selenium Regulation

Component Symbol

Se: **Se**

Apo-tRNA_{uga}: **J**

Sec-tRNA_{uga}: **J** with **Se** attached

GPX1 mRNA: **U-G-A** (purple)

Translating GPX1 mRNA: **U-G-A** (purple) with ribosomes

GPX4 mRNA: **U-G-A** (cyan)

Translating GPX4 mRNA: **U-G-A** (cyan) with ribosomes

GPX1: **Blue cluster**

GPX4: **Pink dot**

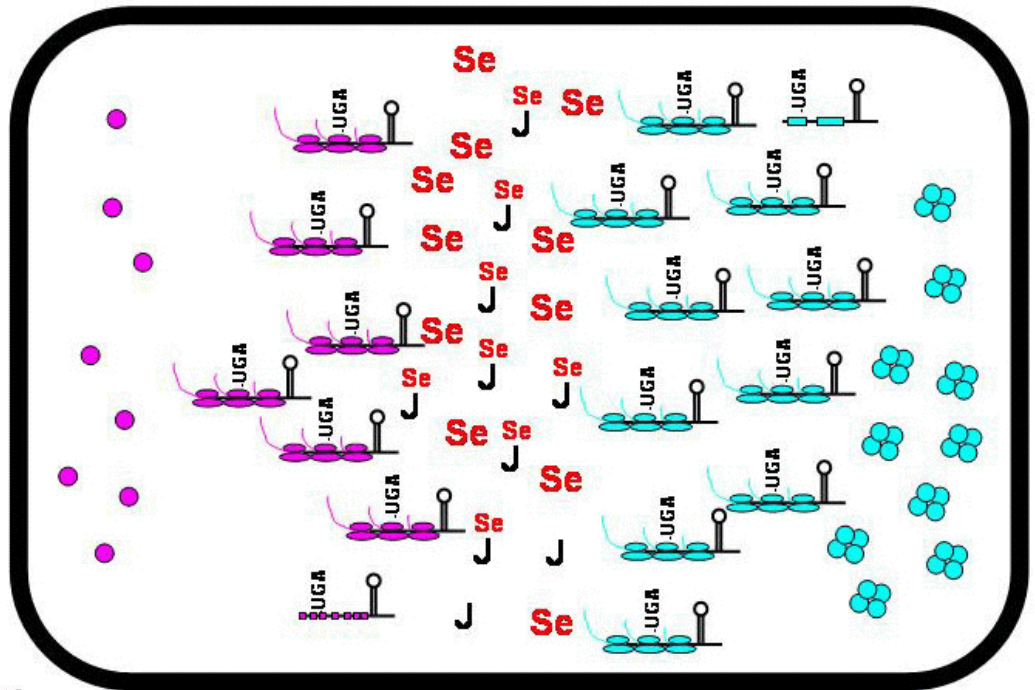
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Selenium Regulation

Component Symbol

Se: **Se**

Apo-tRNA_{uga}: **J**

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GPX1 mRNA: **U-G-A** (purple)

Translating GPX1 mRNA: **U-G-A** (purple) with ribosomes

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Translating GPX4 mRNA: **U-G-A** (cyan) with ribosomes

GPX1: **Blue cluster**

GPX4: **Pink dot**

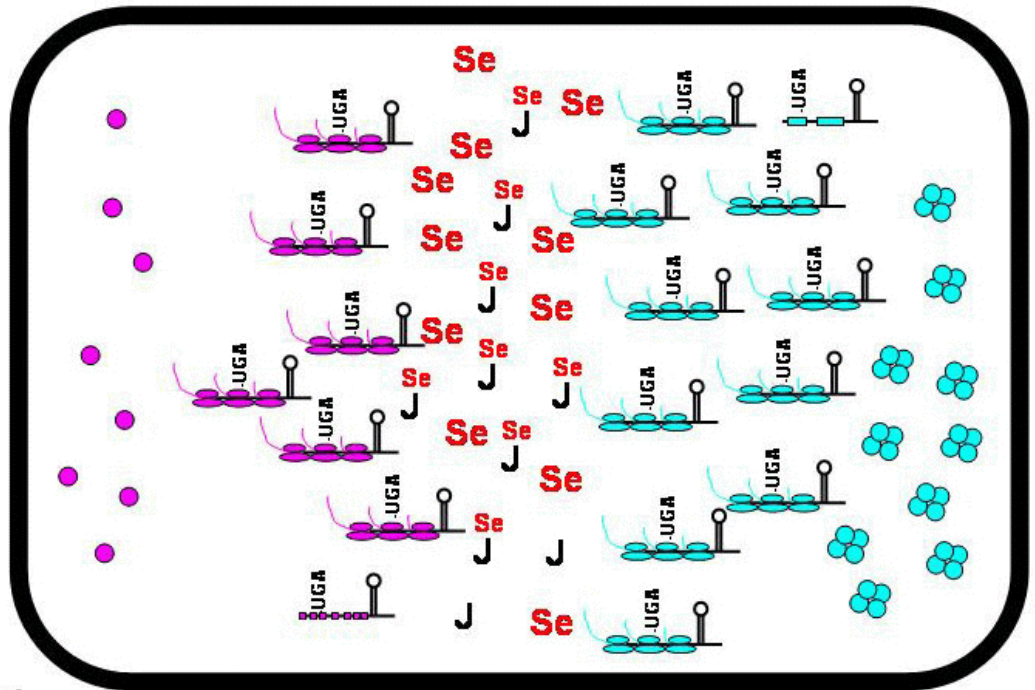
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Selenium Regulation

Component Symbol

Se: **Se**

Apo-tRNA_{uga}: **J**

Sec-tRNA_{uga}: **J** with **Se** attached

GPX1 mRNA: **U-G-A** sequence

Translating GPX1 mRNA: **U-G-A** sequence with ribosome

GPX4 mRNA: **U-G-A** sequence

Translating GPX4 mRNA: **U-G-A** sequence with ribosome

GPX1: **Blue cluster**

GPX4: **Pink dot**

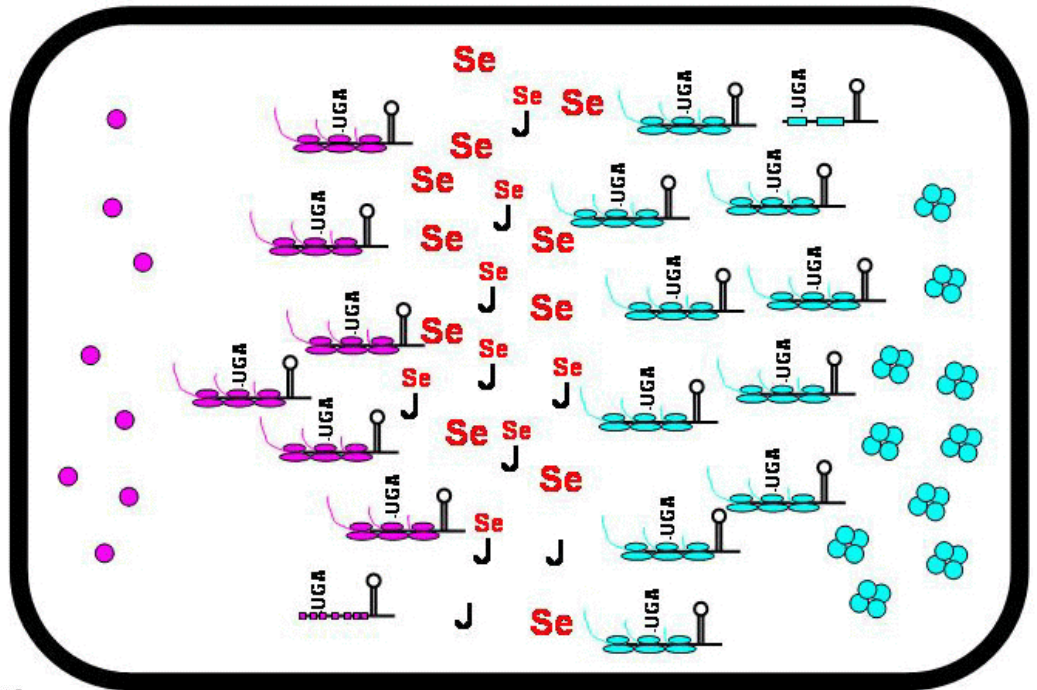
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Selenium Regulation

Component Symbol

Se: Se

Apo-tRNA_{uga}: J

Sec-tRNA_{uga}: J^{Se}

GPX1 mRNA:

Translating GPX1 mRNA:

GPX4 mRNA:

Translating GPX4 mRNA:

GPX1:

GPX4:

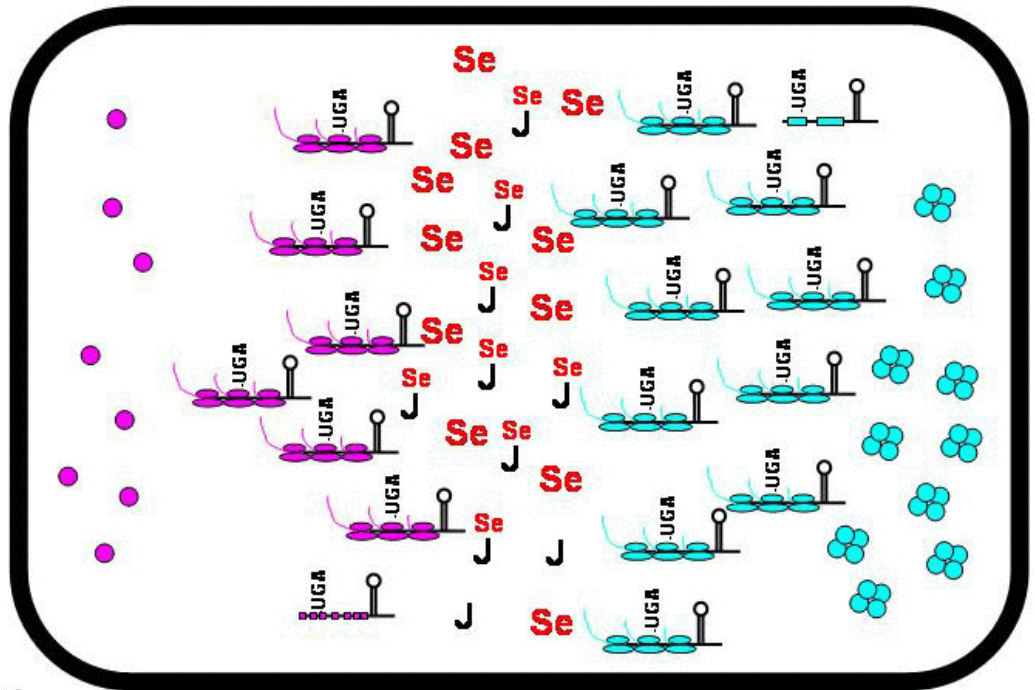
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Selenium Regulation

Component Symbol

Se: Se

Apo-tRNA_{uga}: J

Sec-tRNA_{uga}: J^{Se}

GPX1 mRNA:

Translating GPX1 mRNA:

GPX4 mRNA:

Translating GPX4 mRNA:

GPX1:

GPX4:

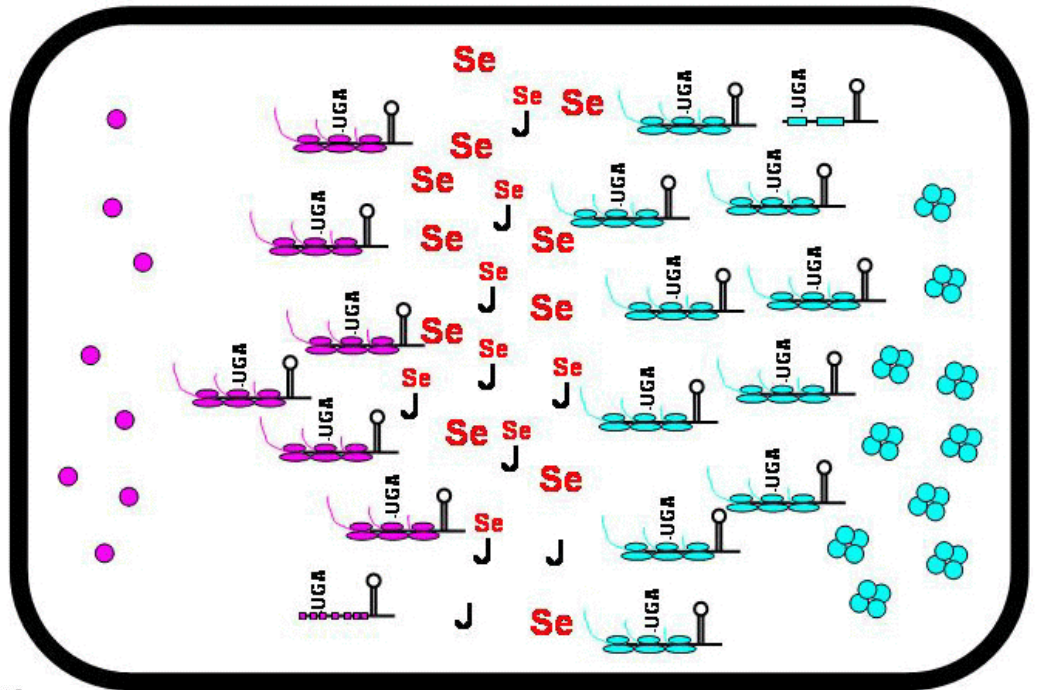
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Component Symbol

Se: **Se**

Apo-tRNA_{UGA}: **J**

Sec-tRNA_{UGA}: **J**

GPX1 mRNA: **J**

Translating GPX1 mRNA: **J**

GPX4 mRNA: **J**

Translating GPX4 mRNA: **J**

GPX1: **●●●●**

GPX4: **●**

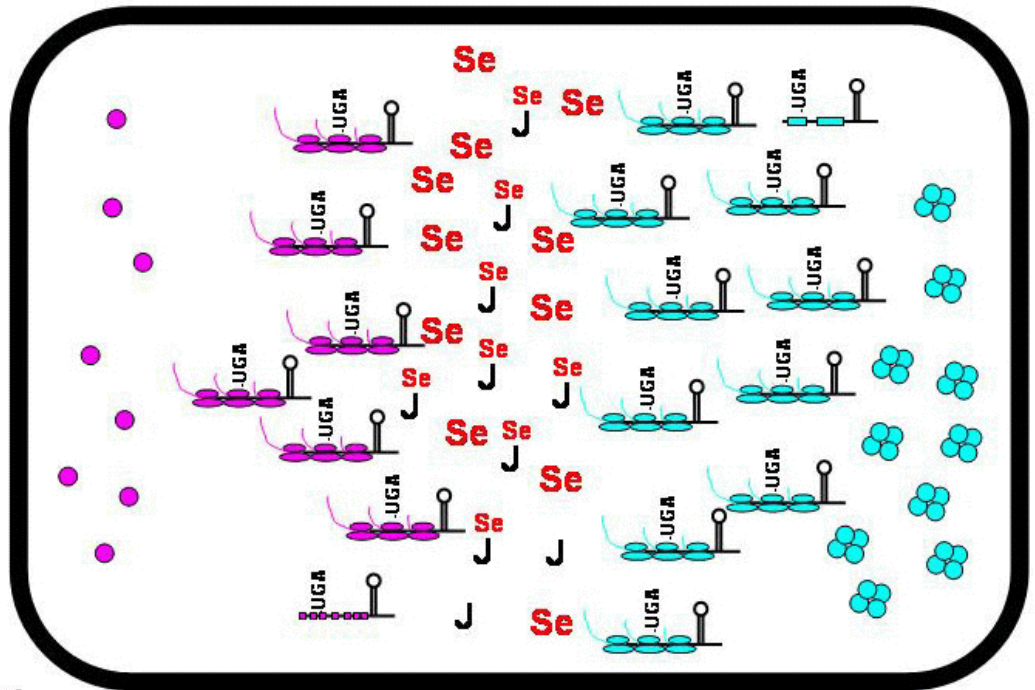
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Selenium Regulation

Component Symbol

Se: **Se**

Apo-tRNA_{uga}: **J**

Sec-tRNA_{uga}: **J** with **Se** attached

GPX1 mRNA: **U-G-A** (purple)

Translating GPX1 mRNA: **U-G-A** (purple) with ribosomes

GPX4 mRNA: **U-G-A** (cyan)

Translating GPX4 mRNA: **U-G-A** (cyan) with ribosomes

GPX1: **Blue cluster**

GPX4: **Pink dot**

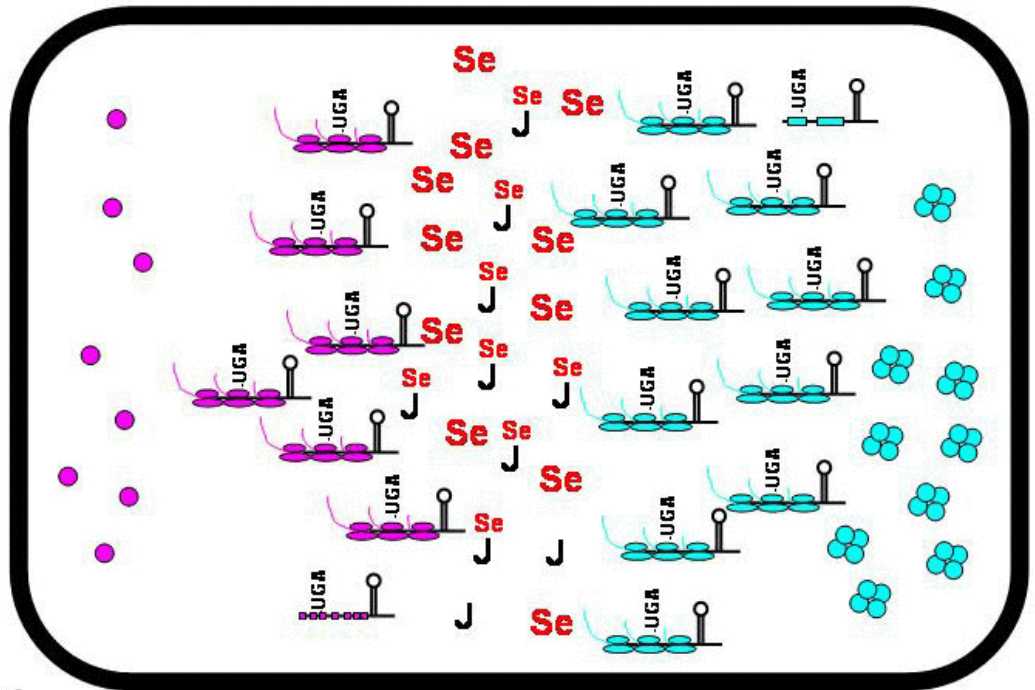
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Selenium Regulation

Component Symbol

Se: **Se**

Apo-tRNA_{uga}: **J**

Sec-tRNA_{uga}: **J** **Se**

GPX1 mRNA:

Translating GPX1 mRNA:

GPX4 mRNA:

Translating GPX4 mRNA:

GPX1:

GPX4:

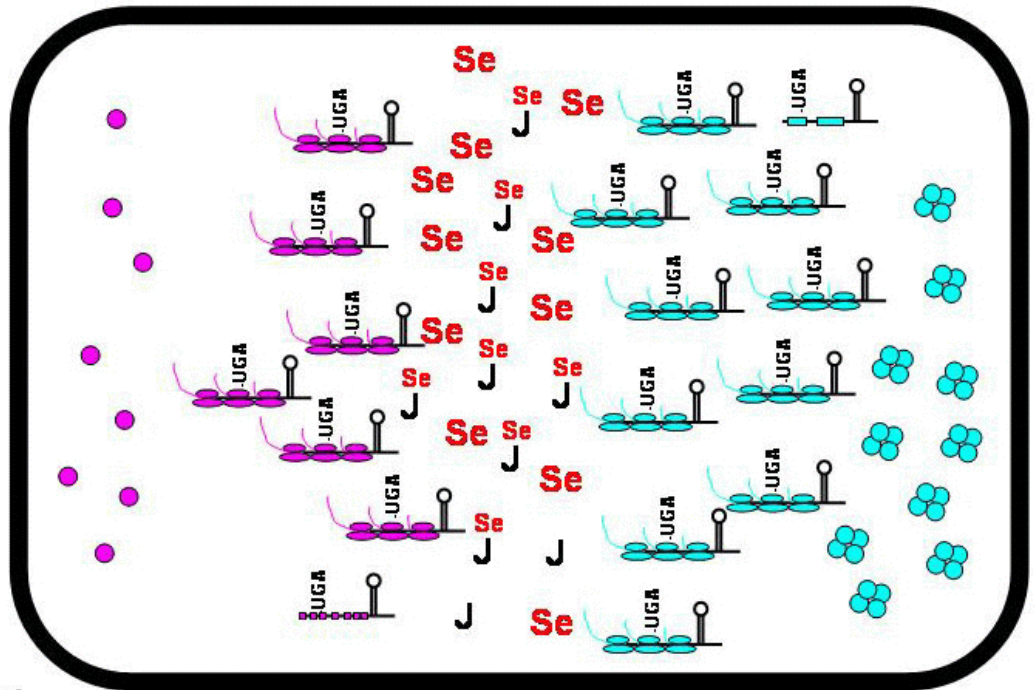
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Sec-tRNA_{UGA}: **J**

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Translating GPX1 mRNA: **J**

GPX4 mRNA: **J**

Translating GPX4 mRNA: **J**

GPX1: **GPX1**

GPX4: **GPX4**

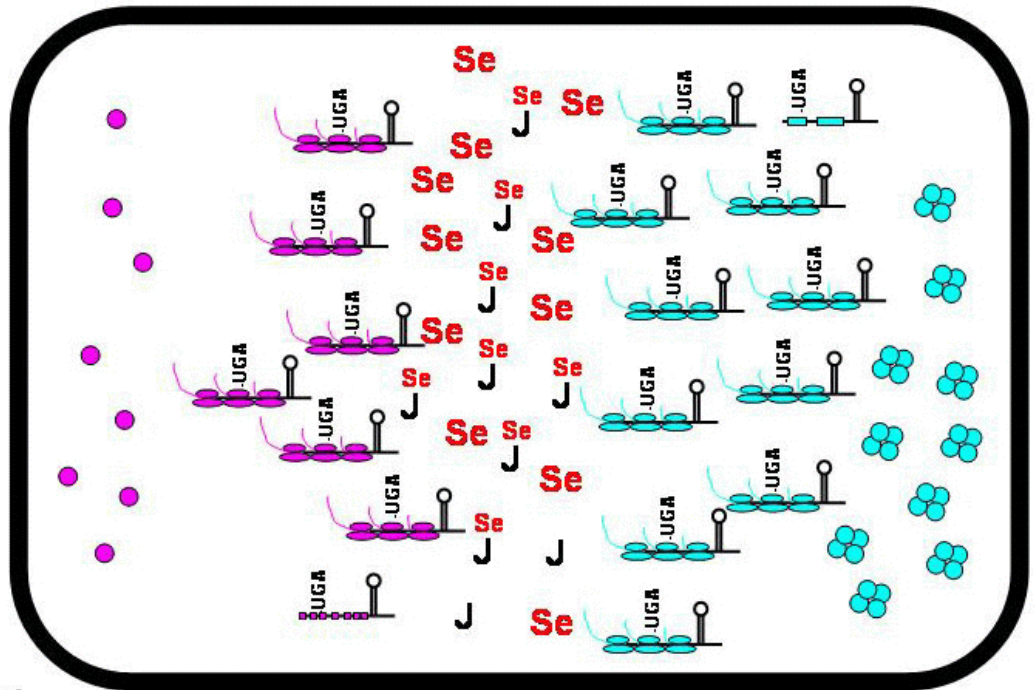
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Selenium Regulation

Component Symbol

Se: **Se**

Apo-tRNA_{uga}: **J**

Sec-tRNA_{uga}: **J** **Se**

GPX1 mRNA:

Translating GPX1 mRNA:

GPX4 mRNA:

Translating GPX4 mRNA:

GPX1:

GPX4:

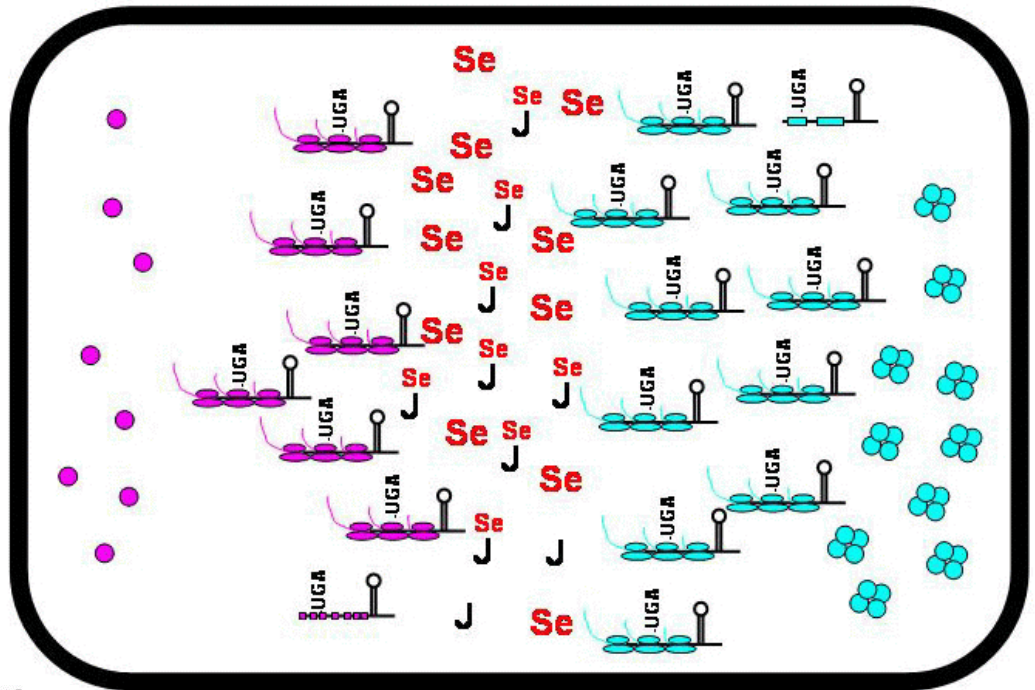
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Selenium Regulation

Component Symbol

Se: **Se**

Apo-tRNA_{uga}: **J**

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GPX1 mRNA: **U-G-A** (purple)

Translating GPX1 mRNA: **U-G-A** (purple) with ribosomes

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Translating GPX4 mRNA: **U-G-A** (cyan) with ribosomes

GPX1: **Blue cluster**

GPX4: **Pink dot**

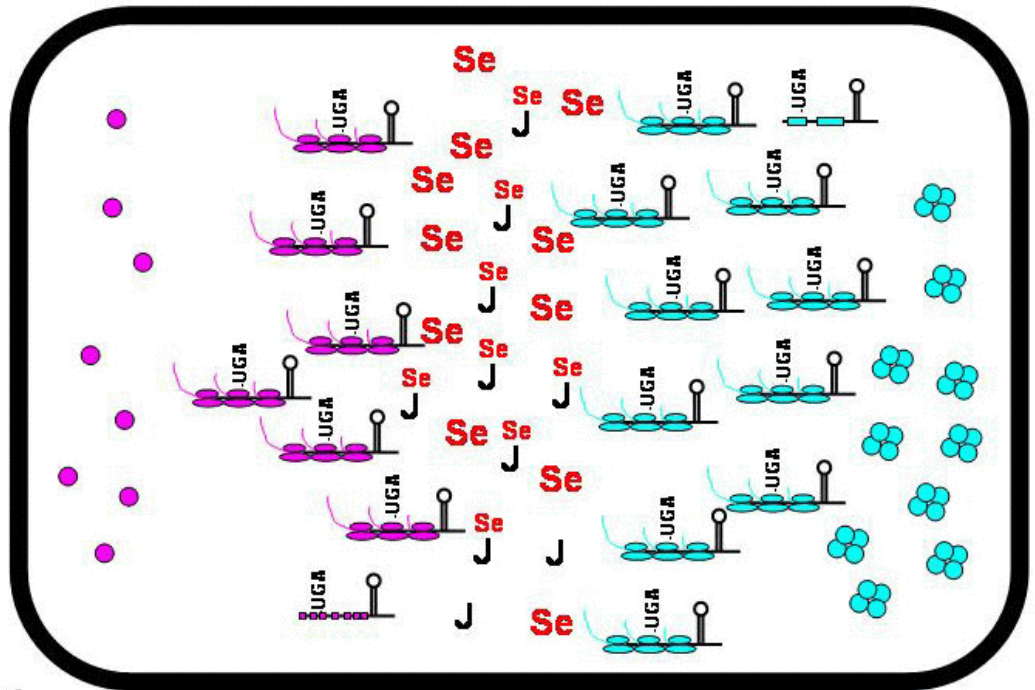
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Translating GPX4 mRNA: **J**

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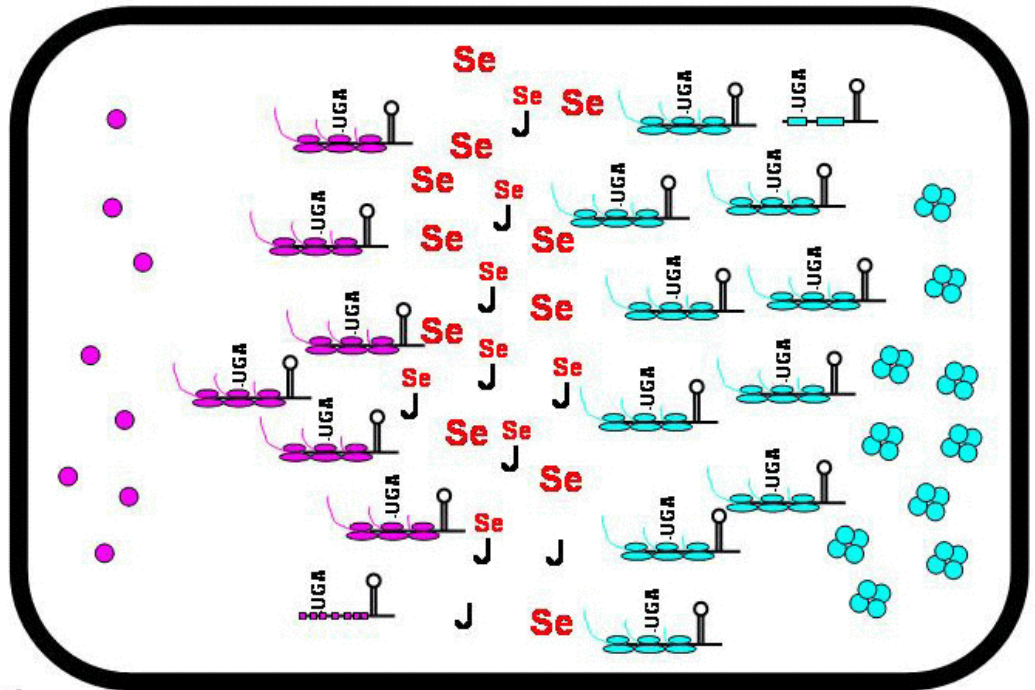
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Selenium Regulation

Component Symbol

Se: **Se**

Apo-tRNA_{uga}: **J**

Sec-tRNA_{uga}: **J** with **Se** attached

GPX1 mRNA: **U-G-A** codon

Translating GPX1 mRNA: **U-G-A** codon with ribosome

GPX4 mRNA: **U-G-A** codon

Translating GPX4 mRNA: **U-G-A** codon with ribosome

GPX1: **Blue cluster**

GPX4: **Pink dot**

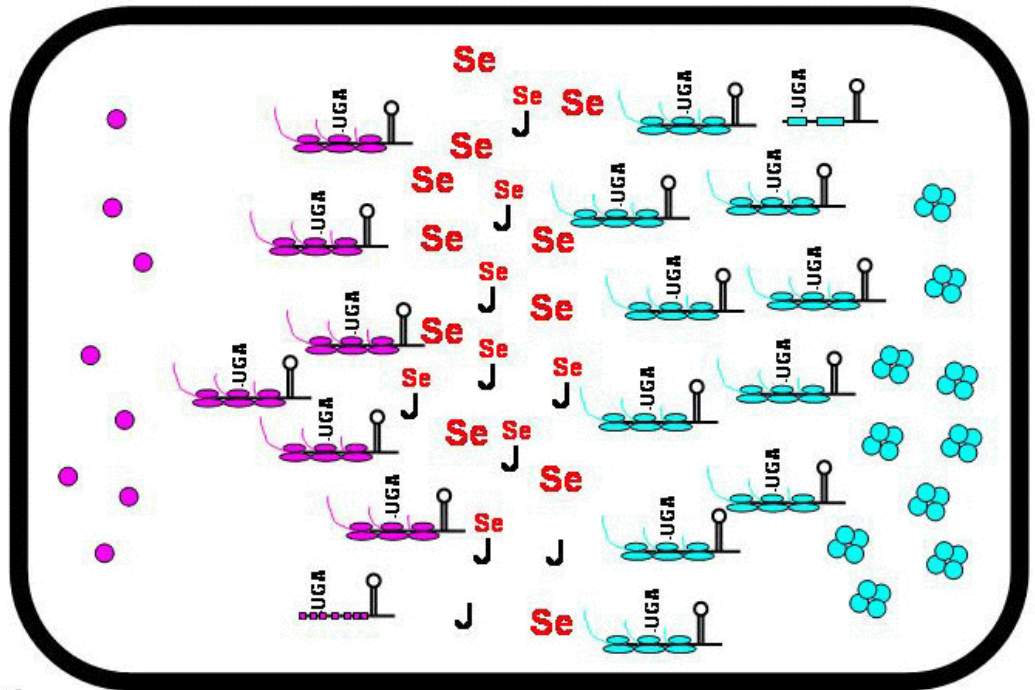
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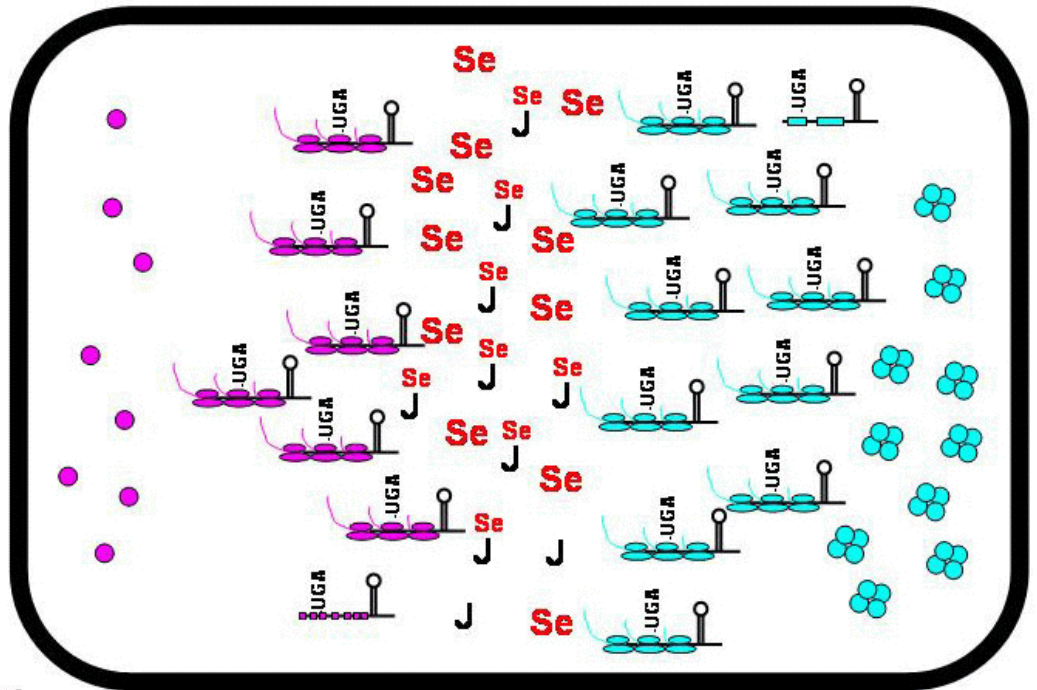
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Selenium Regulation

Component Symbol

Se: **Se**

Apo-tRNA_{uga}: **J**

Sec-tRNA_{uga}: **J** **Se**

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GPX4 mRNA:

Translating GPX4 mRNA:

GPX1:

GPX4:

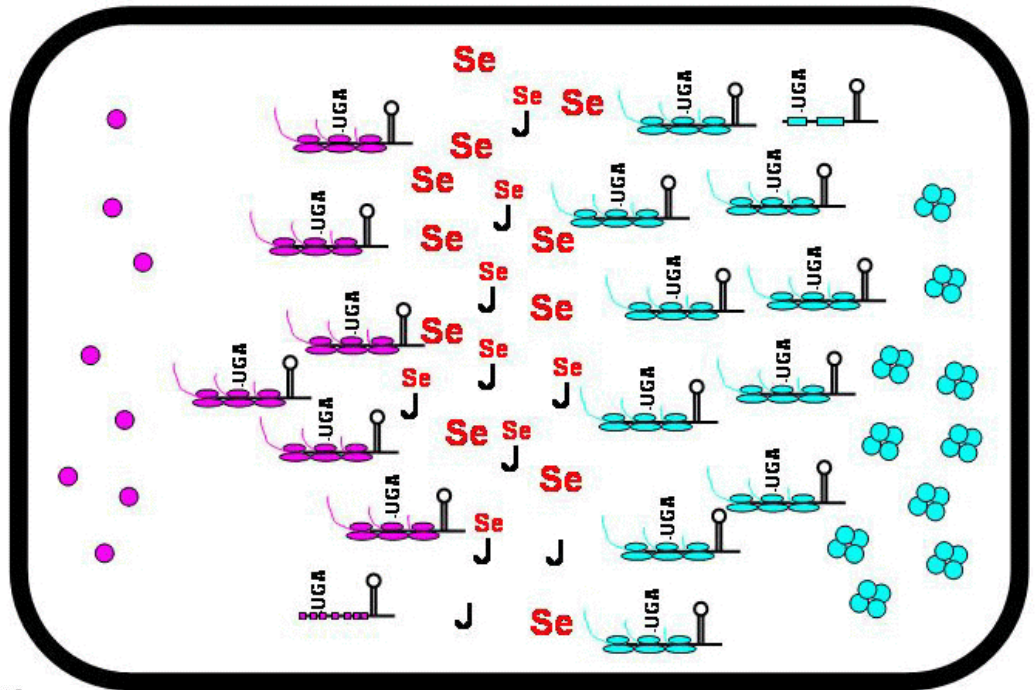
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Selenium Regulation

Component Symbol

Se: Se

Apo-tRNA_{uga}: J

Sec-tRNA_{uga}: J

GPX1 mRNA:

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GPX4 mRNA:

Translating GPX4 mRNA:

GPX1:

GPX4:

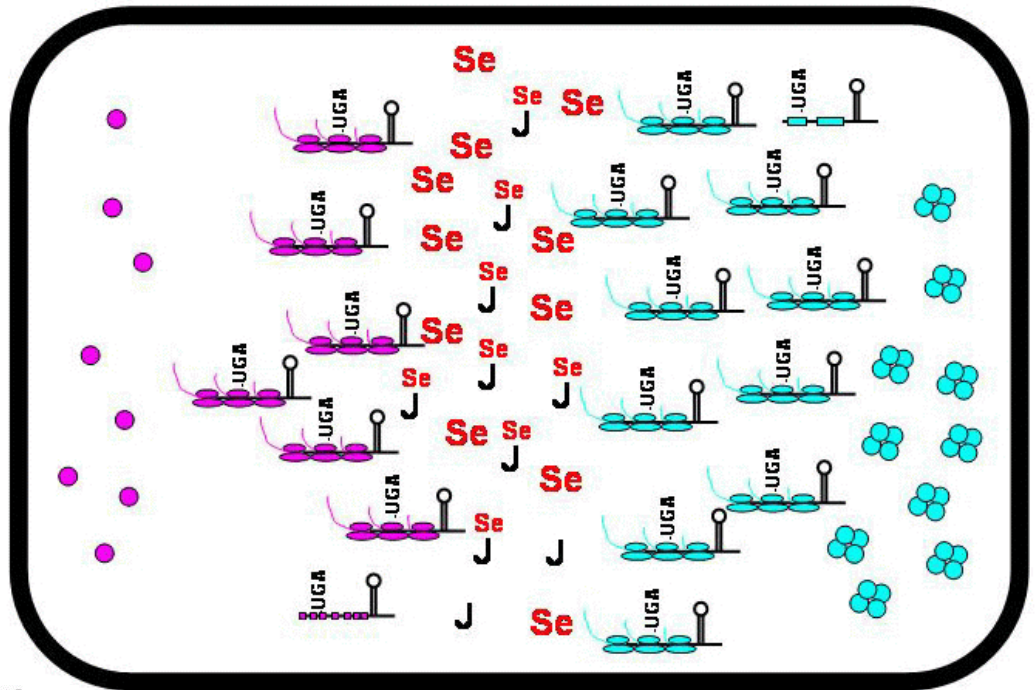
Se-Deficient Cell



Exercise: Using information presented in class and in the assigned readings, draw the relevant components in a selenium-deficient cell. The relative number of components should reflect the change from Se-adequate to Se-deficient (eg. there should be far fewer Se atoms in the Se-deficient cell). On an attached page, explain briefly and justify the number of each component in the Se-deficient cell vrs. the Se-adequate cell.

Se-Adequate Cell

Top: The top cell shows the relevant components for selenium regulation of GPX1 and GPX4 in a Se-adequate cell. Assume that these are liver cells similar to what was observed in rat liver. The key below indicates what each symbol represents. Note that the relative ratio between components (eg. number of GPX1 mRNAs vrs. GPX1 proteins) are not accurate.



Selenium Regulation

Component Symbol

Se: **Se**

Apo-tRNA_{uga}: **J**

Sec-tRNA_{uga}: **J** with **Se** attached

GPX1 mRNA: **U-G-A** (purple)

Translating GPX1 mRNA: **U-G-A** (purple) with ribosomes

GPX4 mRNA: **U-G-A** (cyan)

Translating GPX4 mRNA: **U-G-A** (cyan) with ribosomes

GPX1: **Blue cluster**

GPX4: **Pink dot**

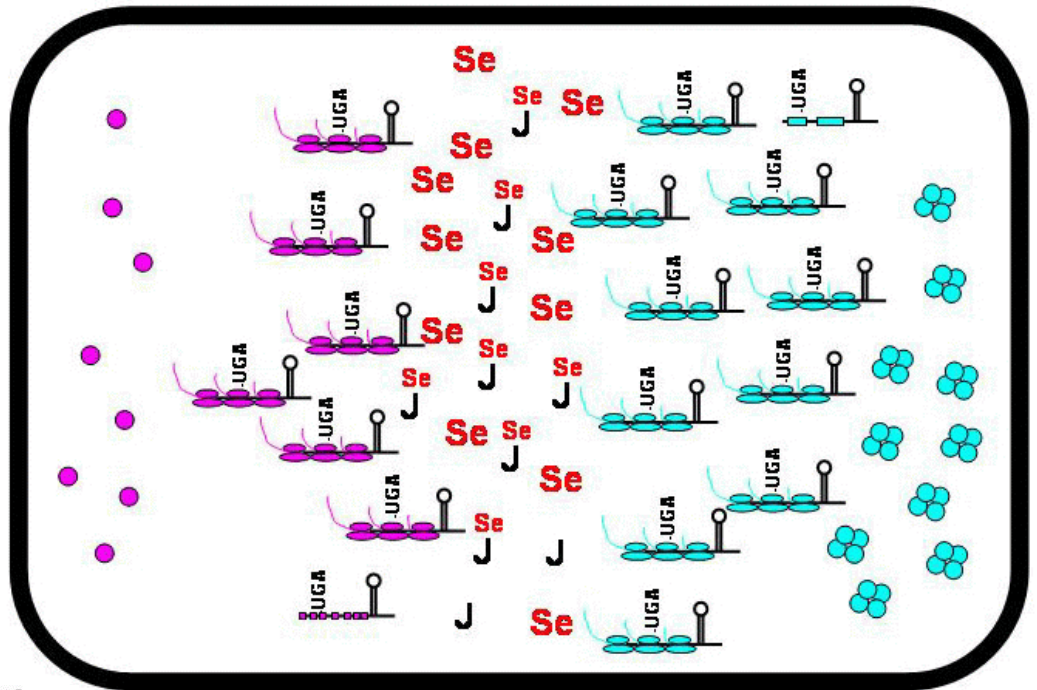
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Selenium Regulation

Component Symbol

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Sec-tRNA_{uga}: **J** with **Se** attached

GPX1 mRNA: **U-G-A** sequence

Translating GPX1 mRNA: **U-G-A** sequence with ribosome

GPX4 mRNA: **U-G-A** sequence

Translating GPX4 mRNA: **U-G-A** sequence with ribosome

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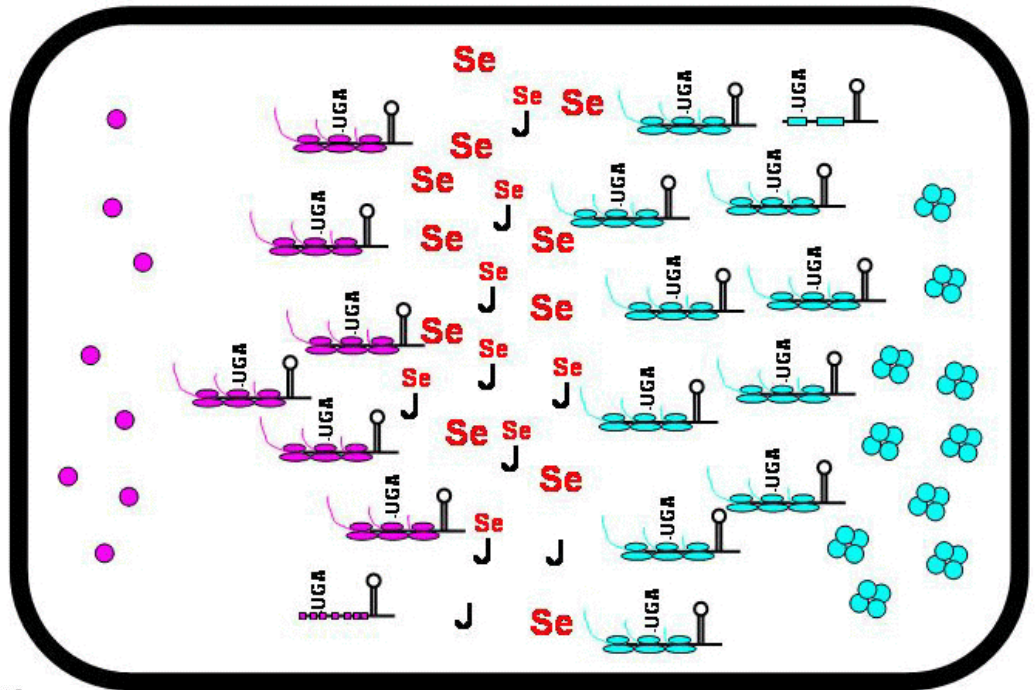
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Sec-tRNA_{UGA}: **J**

GPX1 mRNA: **J**

Translating GPX1 mRNA: **J**

GPX4 mRNA: **J**

Translating GPX4 mRNA: **J**

GPX1: **●●●●**

GPX4: **●**

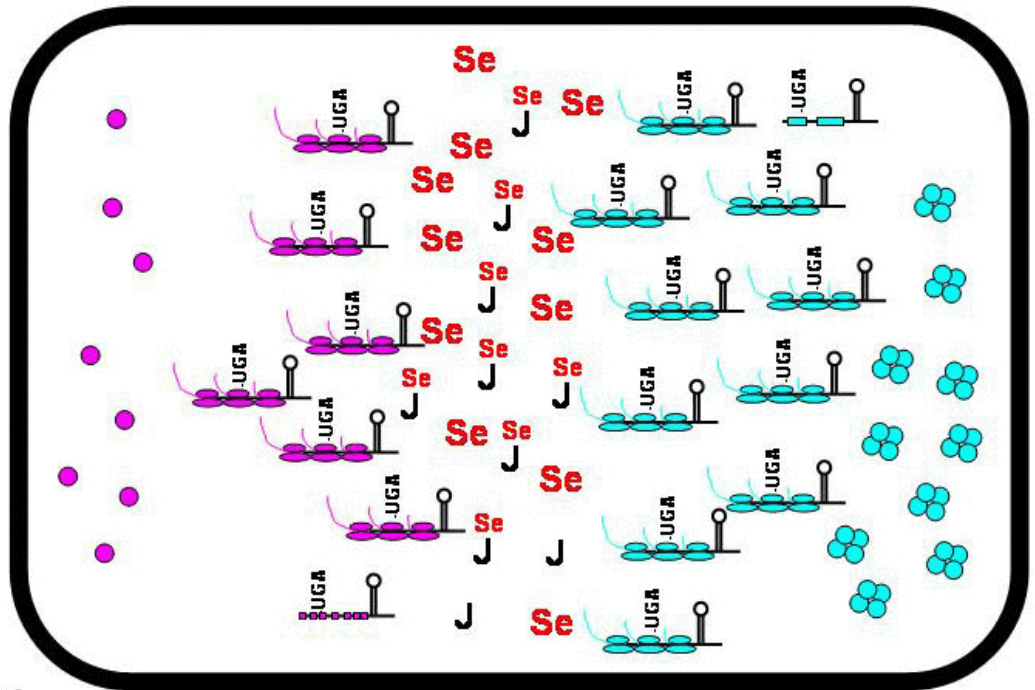
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