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EVROPSKÁ UNIE



MINISTERSTVO ŠKOLSTVÍ,  
MLÁDEŽE A TĚLOVÝCHOVY



OP Vzdělávání  
pro konkurenceschopnost

INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

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# Changes in expression levels of metallothionein in earthworms forming quantum dots

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Reg.č.projektu: CZ.1.07/2.4.00/31.0023

Název projektu: Partnerská síť centra excelentního bionanotechnologického výzkumu



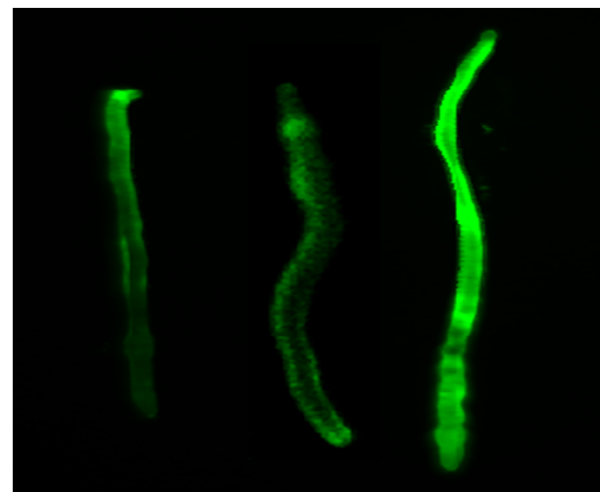
- Metallothionein gene expression is induced by a high variety of stimuli, as metal exposure, oxidative stress, glucocorticoids, hydric stress ...
- The level of the response to these inducers depends on the MT gene

- MT expression is induced by metals (Cu, Zn, Au, Cd, Hg...)
- The expression of metallothionein occurs after binding of the metal-responsive transcription factor-1 (MTF-1) to promoters containing a metal-responsive element (MRE)
- MTF-1 is the main activator of metallothionein genes

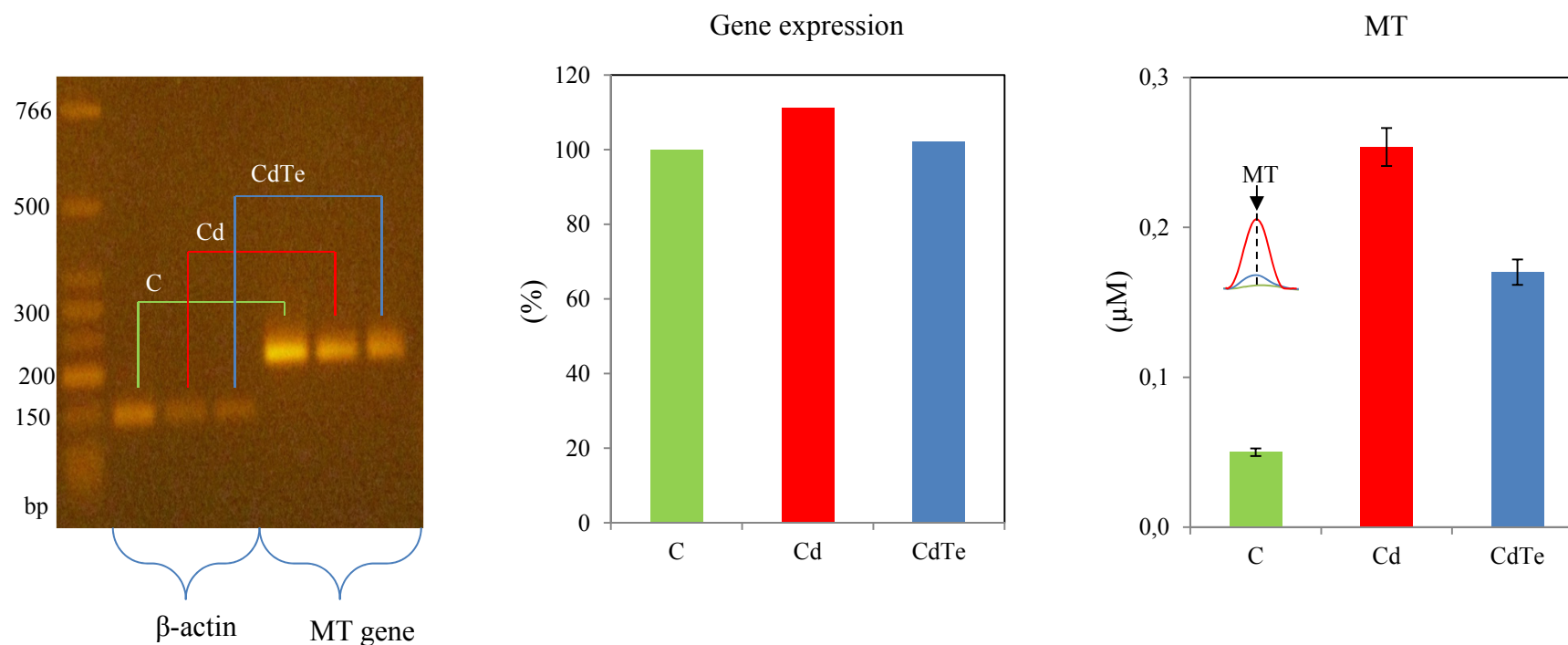
# RT-PCR of MT

- The earthworms (*Eisenia fetida*) were kept for 11 days in the 30% moisture soil containing  $\text{CdCl}_2$  and  $\text{Na}_2\text{TeO}_3$
- PrimeScript One Step RT-PCR Kit (TaKaRa) was used for RT-PCR

- **MT gene primer**
  - F primer: CGCAAGAGAGGGATCAACTT
  - R primer: TATTTCAATGCCTCGGCTCT
  - PCR length : 228bp
- **$\beta$ -Actin primer**
  - F primer: TCCATCGTCCACAGAAAG
  - R primer: AAATGTCCTCCGCAAGCT
  - PCR length: 149 bp



# Changes in expression levels



- **Control (96% identical sequence of *Eisenia foetida* mRNA for metallothionein)**

ACTGCAGATGTTTGAAAAGTGAGTGCTTGCCAGGCTGCAAAAAGCTTTGCTGTGCTGATGCTGAGAAAGGCAAATGTGGA  
AATGCAGGCTGCAAGTGCAGGGGCAGCTTGCAAATGCTCGGCGGGTTCGTGCGCCGCAGGATGCAAGAAGGGATGCTGTG  
GTGACTAGTTGAGAGCCGAGGCATTGAAATAAACTAA

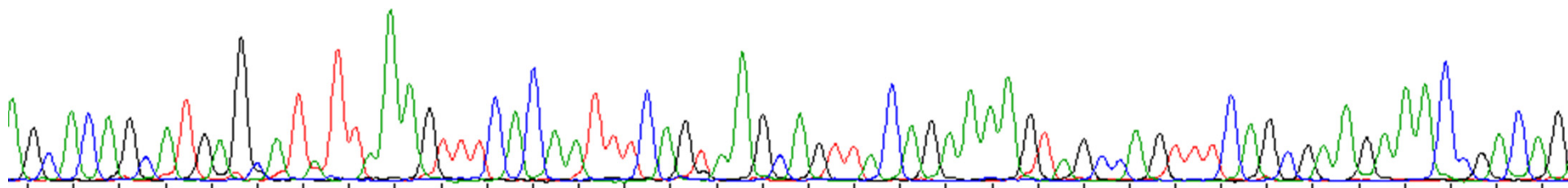
- **Cd (95% identical sequence of *Eisenia foetida* mRNA for metallothionein)**

ACTGCAGATGTTTGAAAAGTGATTGCTTGCCAGGCTGCAAAAAGCTTTGCTGTGCTGACGCTGAGAAGGGCAAATGTGGA  
AATGCAGGCTGCAAGTGCAGGGGCAGCTTGCAAATGCTCGGCGGGTTCGTGCGCCGCAGGATGCAAGAAGGGATGCTGTG  
GTGACTAGTTGAGAGCCGAGGCATTGAAATAAAATAA

- **CdTe (95% identical sequence of *Eisenia foetida* mRNA for metallothionein)**

ACTGCAGATGTTTGAAAAGTGATTGCTTGCCAGGTCTGCAAAAAGCTTTGCTGTGCTGACGCTGAGAAGGGCAAATGTGG  
AAATGCAGGCTGCAAGTGCAGGGGCAGCTTGCAAATGCTCGGCGGGTTCGTGCGCCGCAGGATGCAAGAAGGGATGCTGTG  
GGTACTAGTTGGAGAGCCGAGGCATAGAAATAAGAGATAA

G C T G T G C T G A C G C T G A G A A G G G C A A A T G T G G A A A T G C A G G C T G C A A G T G C G G G G C A G C T T G C A A A T G C T C G G C G G G T T C G T G C C C





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# Thank you for your attention

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