

19_CONCORSO PUBBLICO, PER TITOLI ED ESAMI, PER LA COPERTURA A TEMPO DETERMINATO, DELLA DURATA DI CINQUE ANNI, PER N. 1 POSTO DI COLLABORATORE PROFESSIONALE DI RICERCA SANITARIA, CATEGORIA D, PER LA UOC SERVIZIO DI MEDICINA DI LABORATORIO – GENETICA MEDICA E NEUROGENETICA

PROVA 1

1. Descrivere le principali differenze nella struttura delle colonne di un microscopio elettronico a trasmissione e di uno a scansione, nella preparazione dei campioni e nel tipo di immagini ottenibili
2. La seguente formula Excel “=SOMMA(B1:B10)”
 - a. calcola la somma di tutti i valori contenuti nelle celle da B1 a B10 estremi inclusi
 - b. calcola la media dei valori contenuti da B1 a B10
 - c. calcola la somma del contenuto della cella B1 con il contenuto della cella B10
3. Leggere e tradurre



REPORT

In situ cryo-electron tomography reveals local cellular machineries for axon branch development

Hana Nedelkova^{1,2*}, Nirakar Basnet^{2*}, Iosune Ibáñez¹, Satish Bodakuntla², Christian Bieri², and Naoko Mizuno^{2,3}

Neurons are highly polarized cells forming an intricate network of dendrites and axons. They are shaped by the dynamic reorganization of cytoskeleton components and cellular organelles. Axon branching allows the formation of new paths and increases circuit complexity. However, our understanding of branch formation is sparse due to the lack of direct in-depth observations. Using in situ cellular cryo-electron tomography on primary mouse neurons, we directly visualized the remodeling of organelles and cytoskeleton structures at axon branches. Strikingly, branched areas functioned as hotspots concentrating organelles to support dynamic activities. Unaligned actin filaments assembled at the base of premature branches accompanied by filopodia-like protrusions. Microtubules and ER comigrated into preformed branches to support outgrowth together with accumulating compact, ~500-nm mitochondria and locally clustered ribosomes. We obtained a roadmap of events supporting the hypothesis of local protein synthesis selectively taking place at axon branches, allowing them to serve as unique control hubs for axon development and downstream neural network formation.

Finer
Cell to
neuroscience



PROVA NON ESTRATTA ANNA GHILARDI 30/08/2020

Anna Ghilardi

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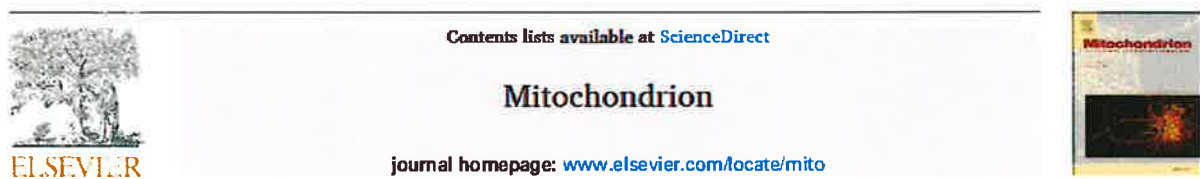
PROVA 2

1. Con il termine “organismo modello” si definisce un qualsiasi sistema procariotico o eucariotico con caratteristiche tali da poter essere usato in laboratorio ai fini di ricerca. La/il candidata/o descriva la sua esperienza diretta e/o le sue conoscenze teoriche sull'argomento.

2. Per URL si intende: una sequenza di caratteri che:
a. identifica univocamente l'indirizzo di una risorsa web
b. un componente del sistema operativo
c. un linguaggio di programmazione

3. Leggere e tradurre

Mitochondrion 65 (2022) 60–87



Review

Mitochondria transfer and transplantation in human health and diseases

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ARTICLE INFO

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Mitochondria transplantation
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Artificial mitochondria
Mitochondria genome editing

ABSTRACT

Mitochondria are dynamic organelles responsible for energy production and cell metabolism. Disorders in mitochondrial function impair tissue integrity and have been implicated in multiple human diseases. Rather than constrained in host cells, mitochondria were recently found to actively travel between cells through nanotubes or extracellular vesicles. Mitochondria transportation represents a key mechanism of intercellular communication implicated in metabolic homeostasis, immune response, and stress signaling. Here we reviewed recent progress in mitochondria transfer under physiological and pathological conditions. Specifically, tumor cells imported mitochondria from adjacent cells in the microenvironment which potentially modulated cancer progression. Intercellular mitochondria trafficking also inspired therapeutic intervention of human diseases with mitochondria transplantation. Artificial mitochondria, generated through mitochondria genome engineering or mitochondria-nucleus hybridization, further advanced our understanding of mitochondrial biology and its therapeutic potential. Innovative tools and animal models of mitochondria transplantation will assist the development of new therapies for mitochondrial dysfunction-related diseases.

Atina
G. K. S.
Mandracchia



PROVA ESTRATTA ANNA GHIARDI 30/8/2022

due filari

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PROVA 3

1. La/il candidata/o descriva la struttura generale del neurone, della sinapsi e quanto gli è noto rispetto alla plasticità neuronale o/e sinaptica da un punto di vista morfologico e funzionale
2. Il termine "Open Source" indica:
 - a. un software i cui autori ne permettono e favoriscono il libero studio e l'apporto di modifiche da parte di altri programmatori
 - b. un software che può essere modificato da chiunque a patto di corrispondere all'autore una offerta libera
 - c. un software protetto da diritti d'autore che non può essere modificato da nessuno tranne da chi ne detiene i diritti
3. Leggere e tradurre



CellPress

Cell

Article

ER-to-Golgi protein delivery through an interwoven, tubular network extending from ER

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SUMMARY

Cellular versatility depends on accurate trafficking of diverse proteins to their organellar destinations. For the secretory pathway (followed by approximately 30% of all proteins), the physical nature of the vessel conducting the first portage (endoplasmic reticulum [ER] to Golgi apparatus) is unclear. We provide a dynamic 3D view of early secretory compartments in mammalian cells with isotropic resolution and precise protein localization using whole-cell, focused ion beam scanning electron microscopy with cryo-structured illumination microscopy and live-cell synchronized cargo release approaches. Rather than vesicles alone, the ER spans an elaborate, interwoven tubular network of contiguous lipid bilayers (ER exit site) for protein export. This receptacle is capable of extending microns along microtubules while still connected to the ER by a thin neck. COPII localizes to this neck region and dynamically regulates cargo entry from the ER, while COPI acts more distally, escorting the detached, accelerating tubular entity on its way to joining the Golgi apparatus through microtubule-directed movement.

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30/08/2022

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