



# DANNO PRIMARIO AL DNA (COMET ASSAY) ED EFFETTI CITOGENETICI (TEST DEL MICRONUCLEO) IN CELLULE DEL CAVO ORALE: DATI PRELIMINARI



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**NORTH- ITALIAN MAPEC WORKSHOP**  
**“Ambiente e salute: esperienze, strategie e  
proposte educative a confronto”**

Brescia, 4 Dicembre 2015

# Premessa ...

International Agency for Research on Cancer

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- Director's Page
- Organizational Structure
- Who's Who

# S SCIENTIFIC PUBLICATIONS

NOW AVAILABLE AS AN **E-BOOK**  
**AIR POLLUTION AND CANCER**

IARC SCIENTIFIC

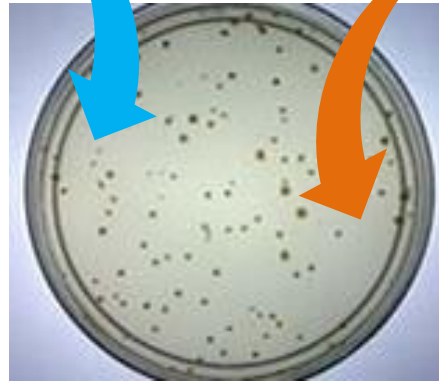


# Premessa ...

□ Test *in vitro* → Epidemiologia:



*Matrici ambientali*



*Salmonella/microsomi test  
(test di Ames)*

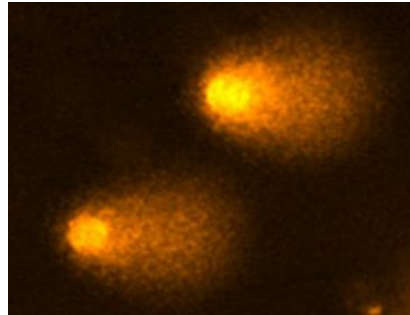


*Matrici biologiche*



# Premessa ...

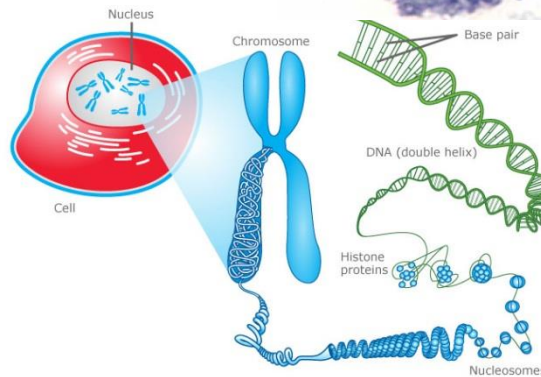
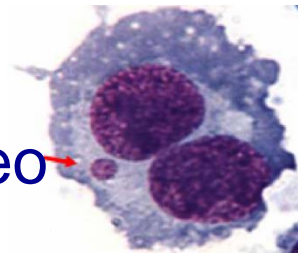
□ Test *in vitro* → Epidemiologia:



Test della cometa



Test del micronucleo

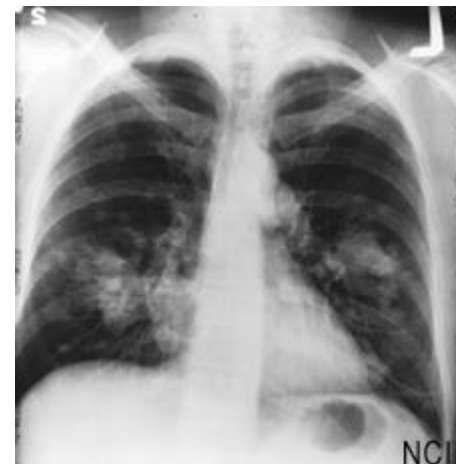


Esposizione



*Black box*

Malattia



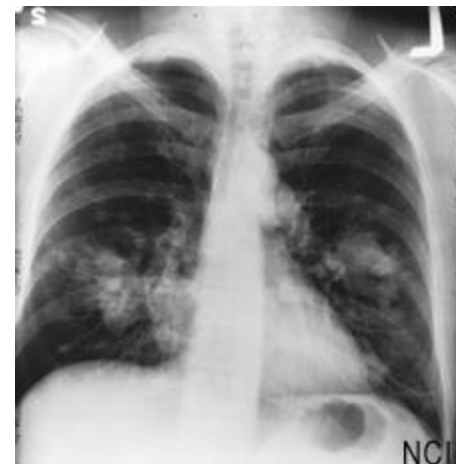
Esposizione

*Glass box*

Malattia



*Black box*

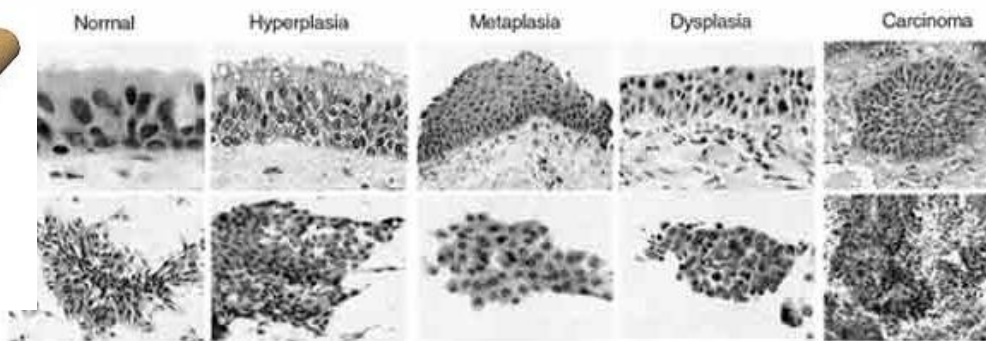




Esposizione

*Glass box*

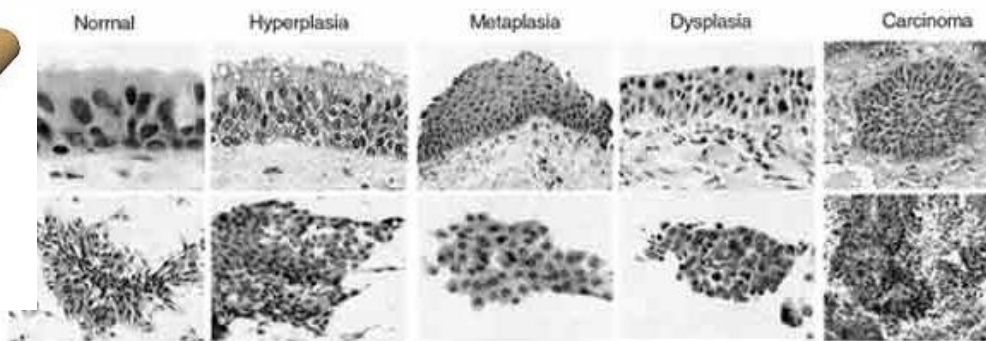
Malattia



Esposizione

*Glass box*

Malattia





Esposizione

*Glass box*

Malattia



## BIOMARCATORI:

Per “biomarcatore” si intende un evento misurabile in un sistema biologico, che possa essere considerato come parte di un *continuum* tra un evento iniziale ed un eventuale risultante stato patologico.

Esposizione

*Glass box*

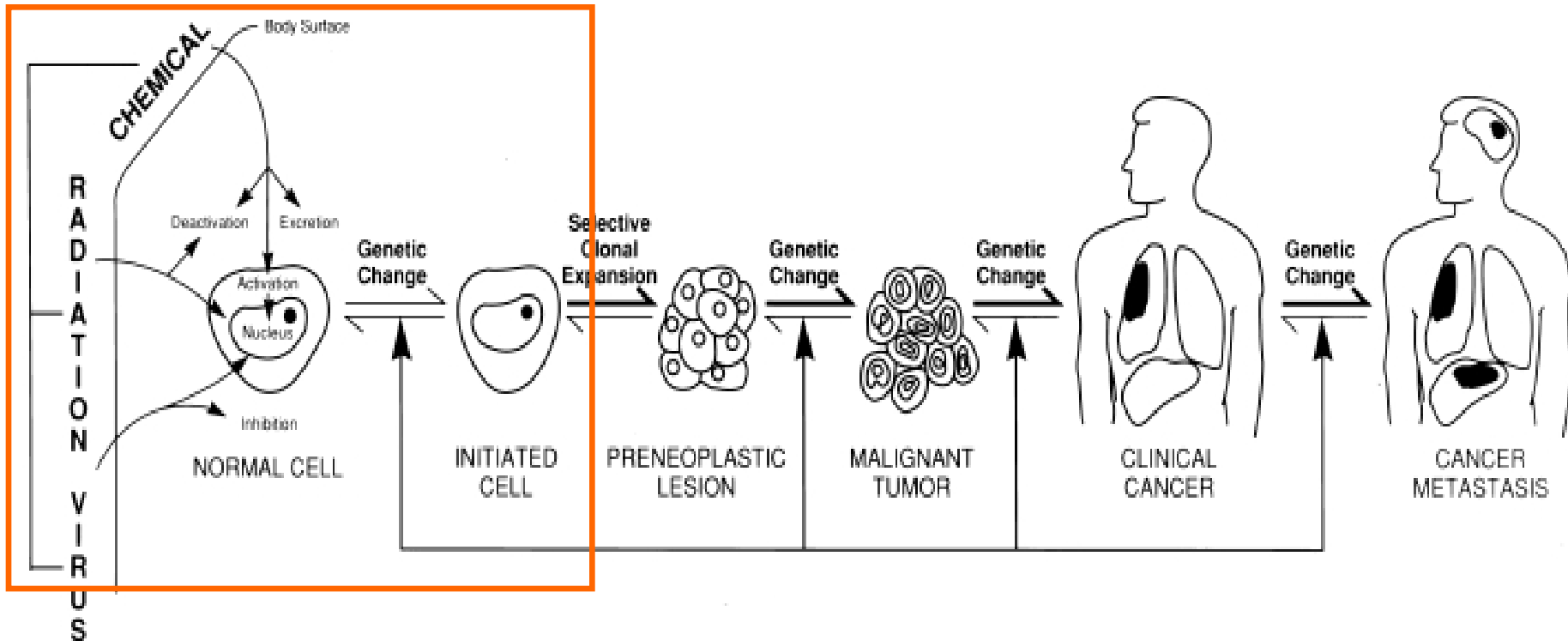
Malattia

Initiation

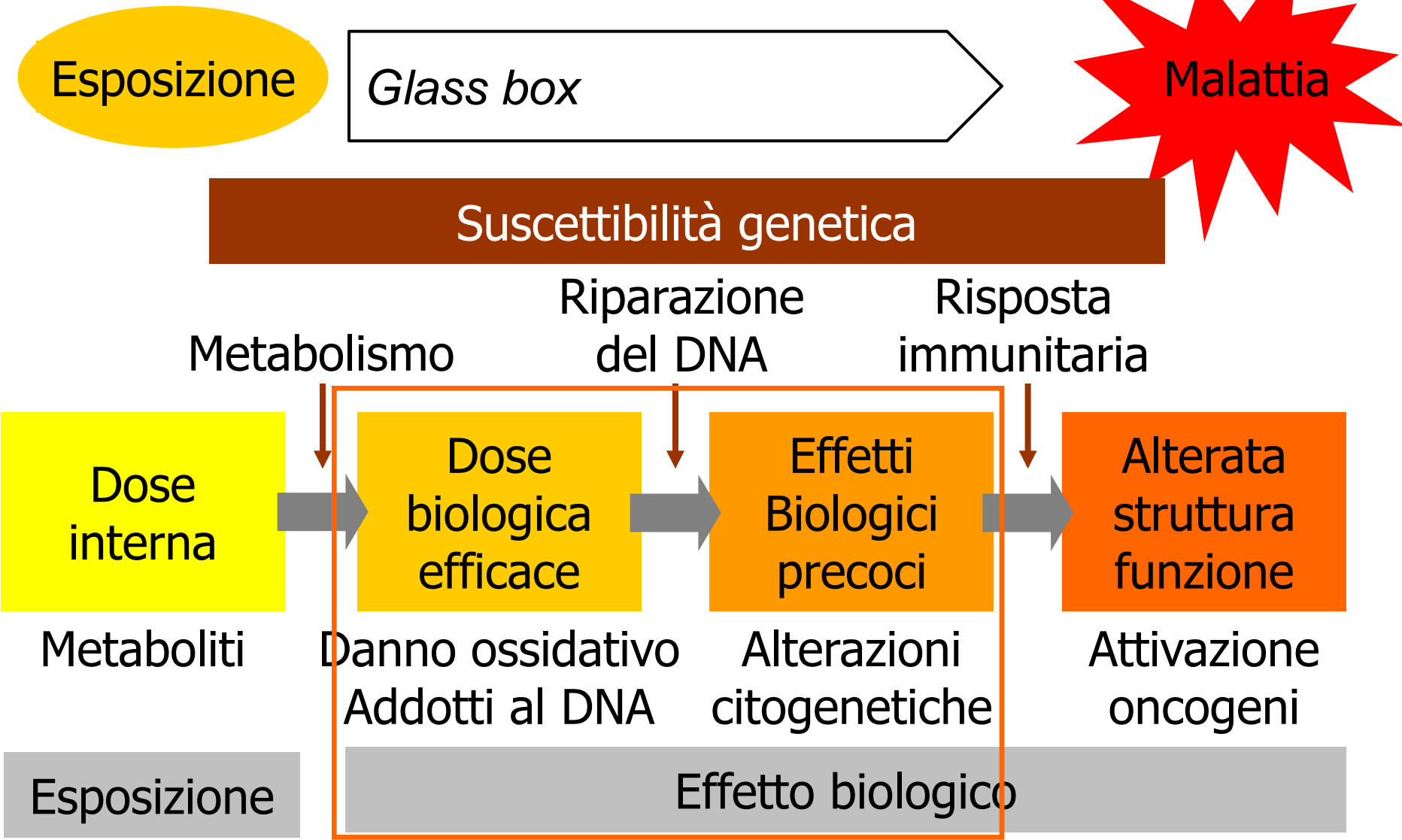
Promotion

Conversion

Progression



# Epidemiologia Molecolare

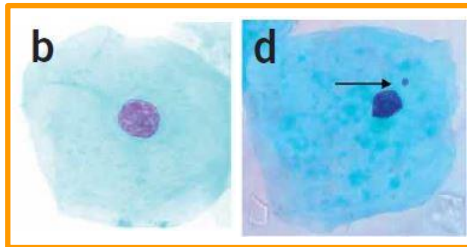


# Campionamento biologico

## Prelievo di cellule del cavo orale dei bambini:



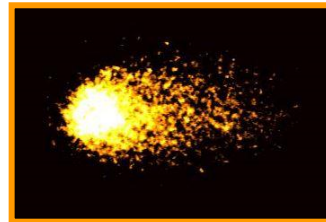
**Cellule epiteliali  
esfoliate**



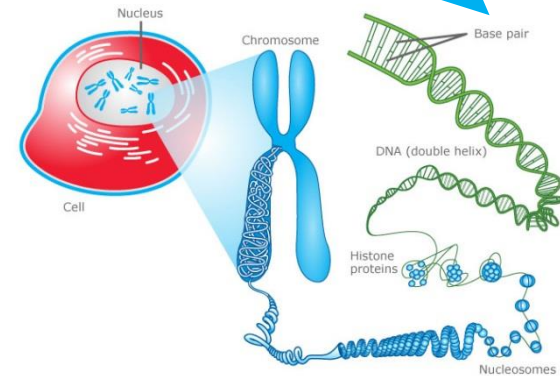
**Test del  
micronucleo**



**Leucociti  
salivari**

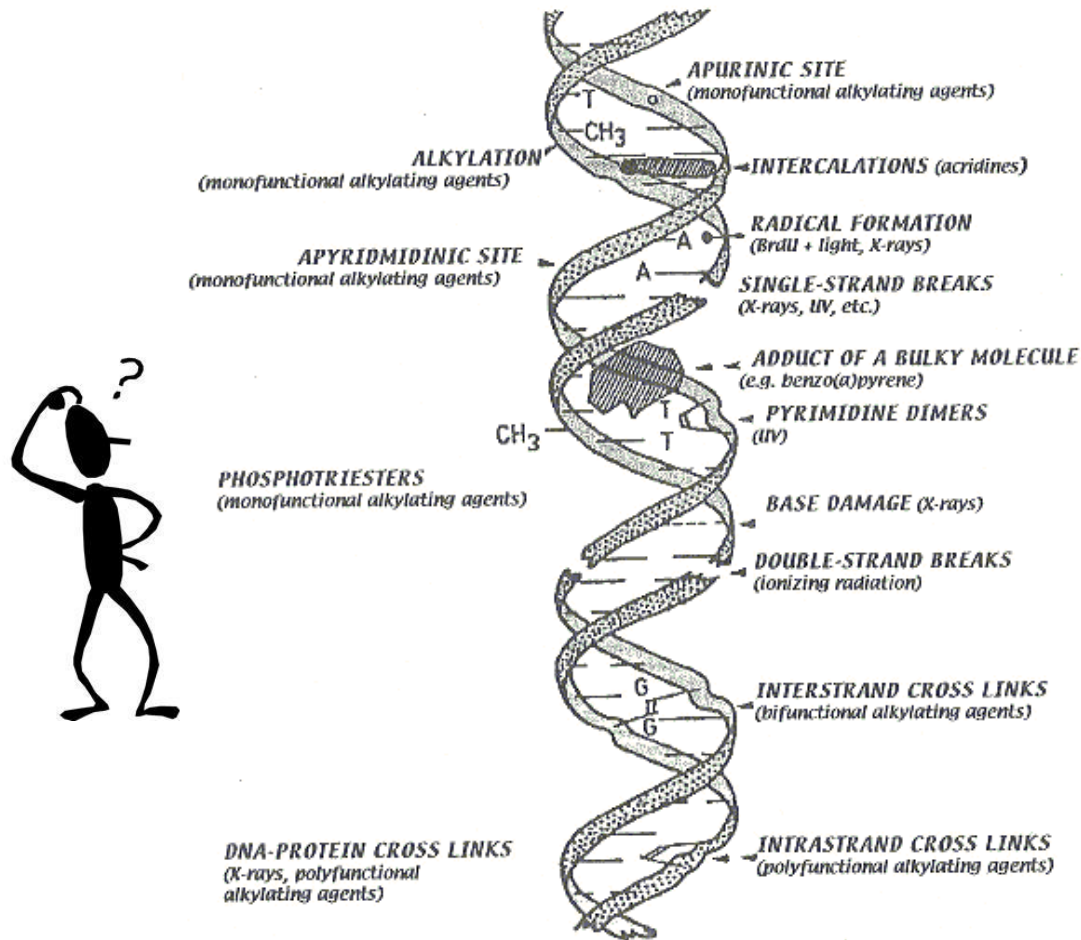


**Comet  
assay**



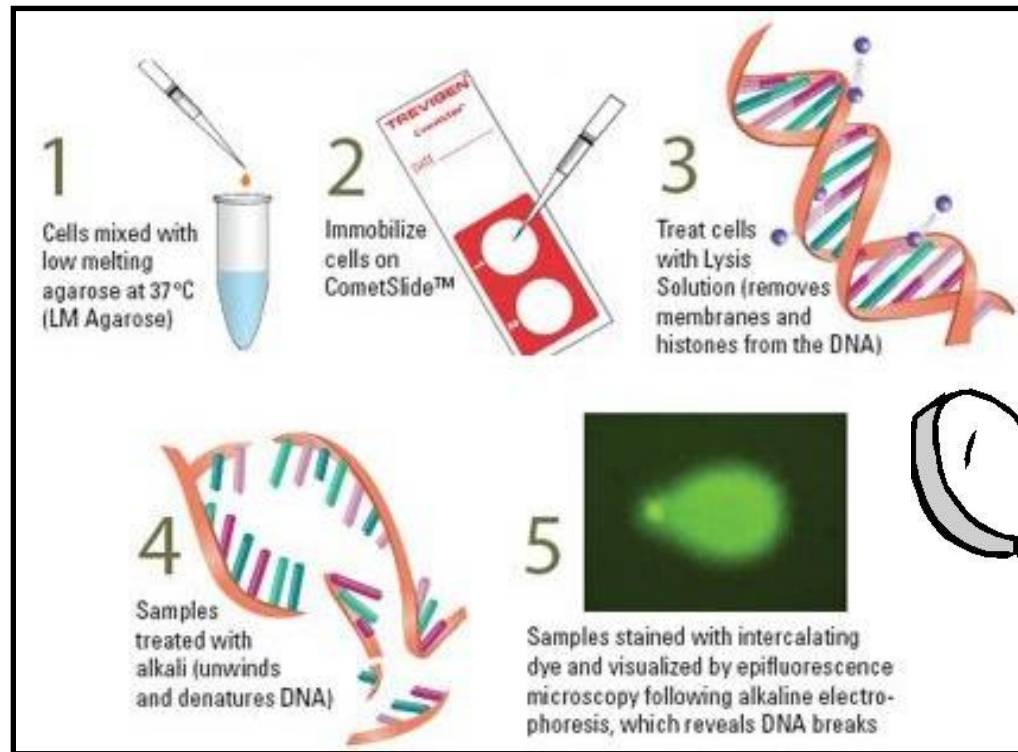
# Comet Assay

□ Biomarcatore di dose biologica efficace:



# Comet Assay

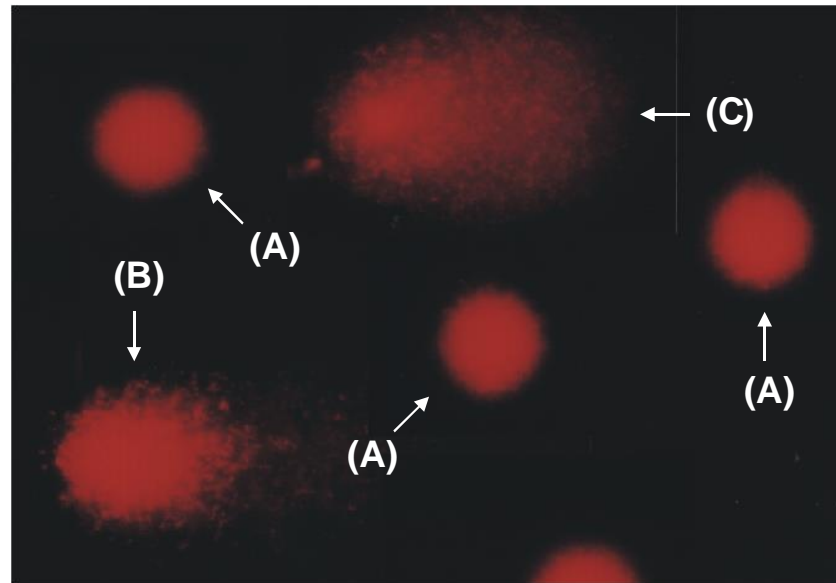
## □ Valutazione del danno primario al DNA:





# Comet Assay

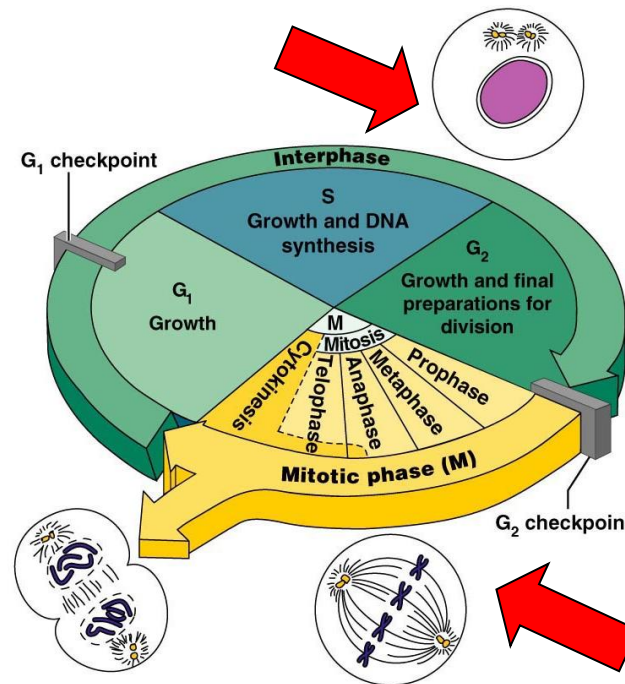
□ Osservazione al microscopio a fluorescenza:



(A) cellule con DNA non danneggiato;  
(B) cellule con DNA moderatamente danneggiato;  
(C) cellule con DNA fortemente danneggiato.

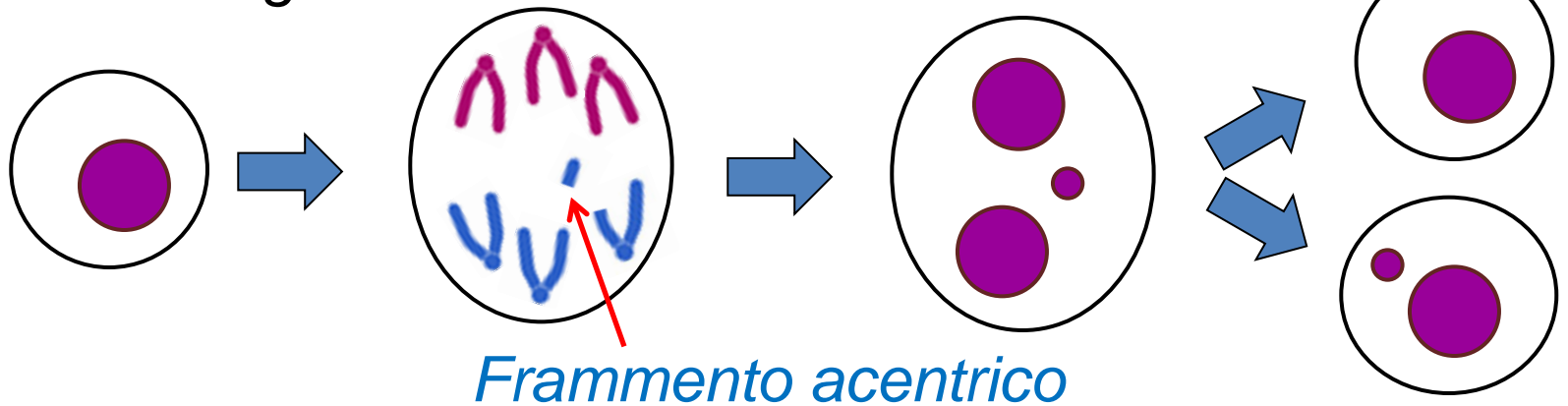
# Test del micronucleo

- Biomarcatore di effetti biologici precoci (citogenetici):

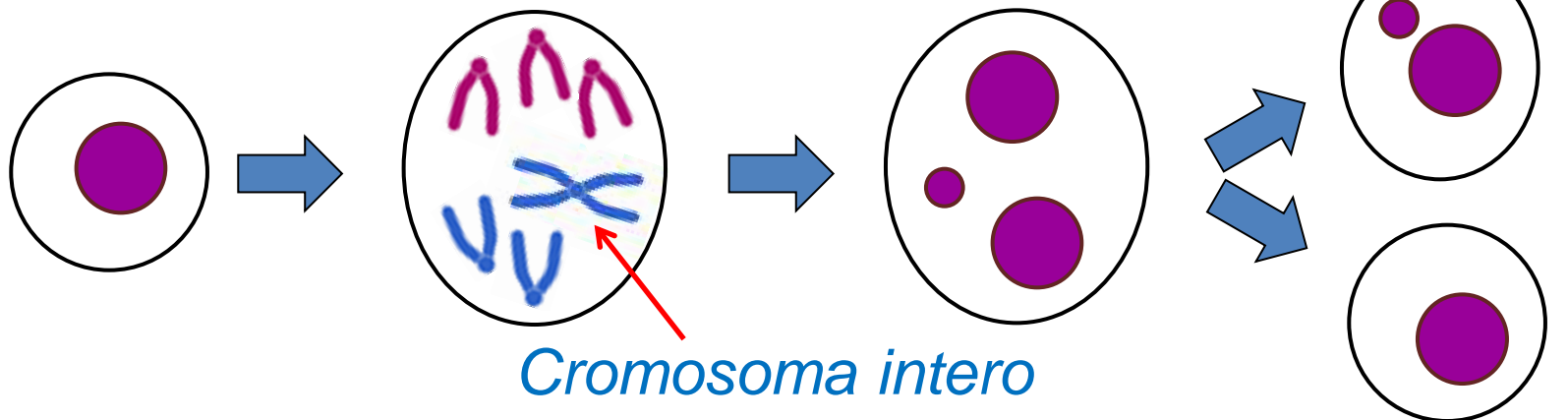


# Test del Micronucleo

## □ Effetto clastogeno:

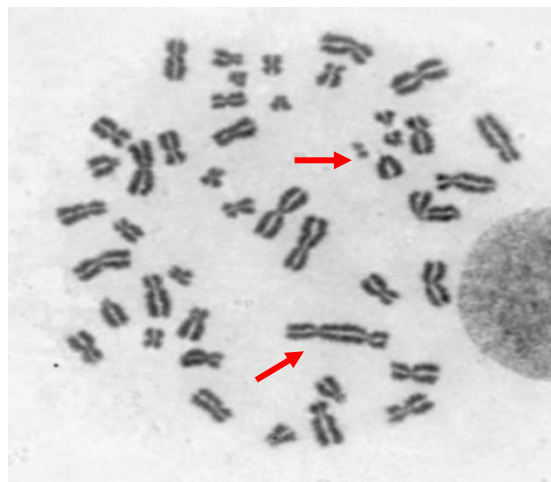


## □ Effetto aneuploidizzante;

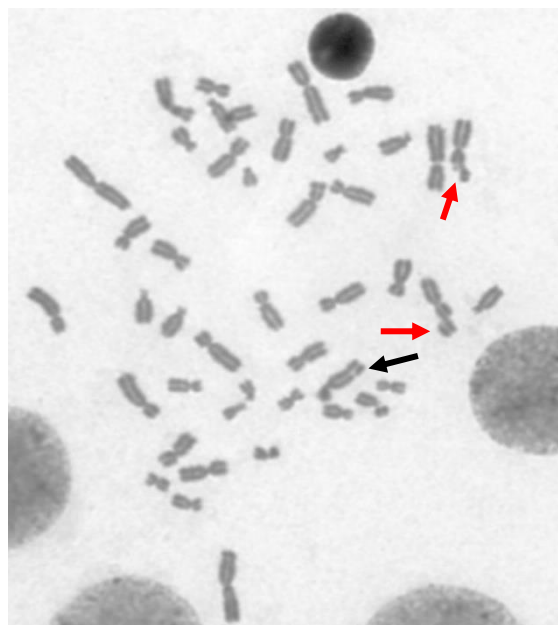


# Test del Micronucleo

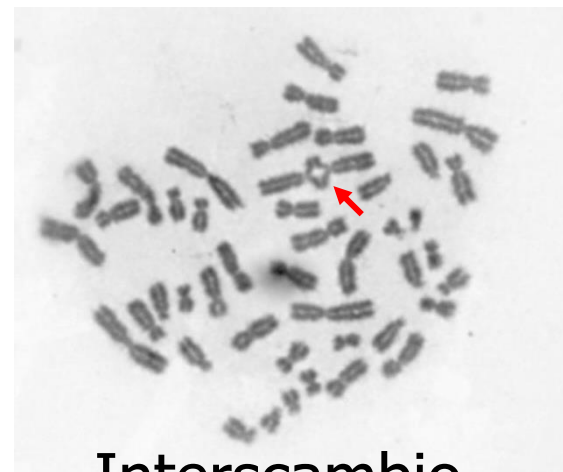
□ Alterazioni citogenetiche visualizzate in metafase:



Dicentrico



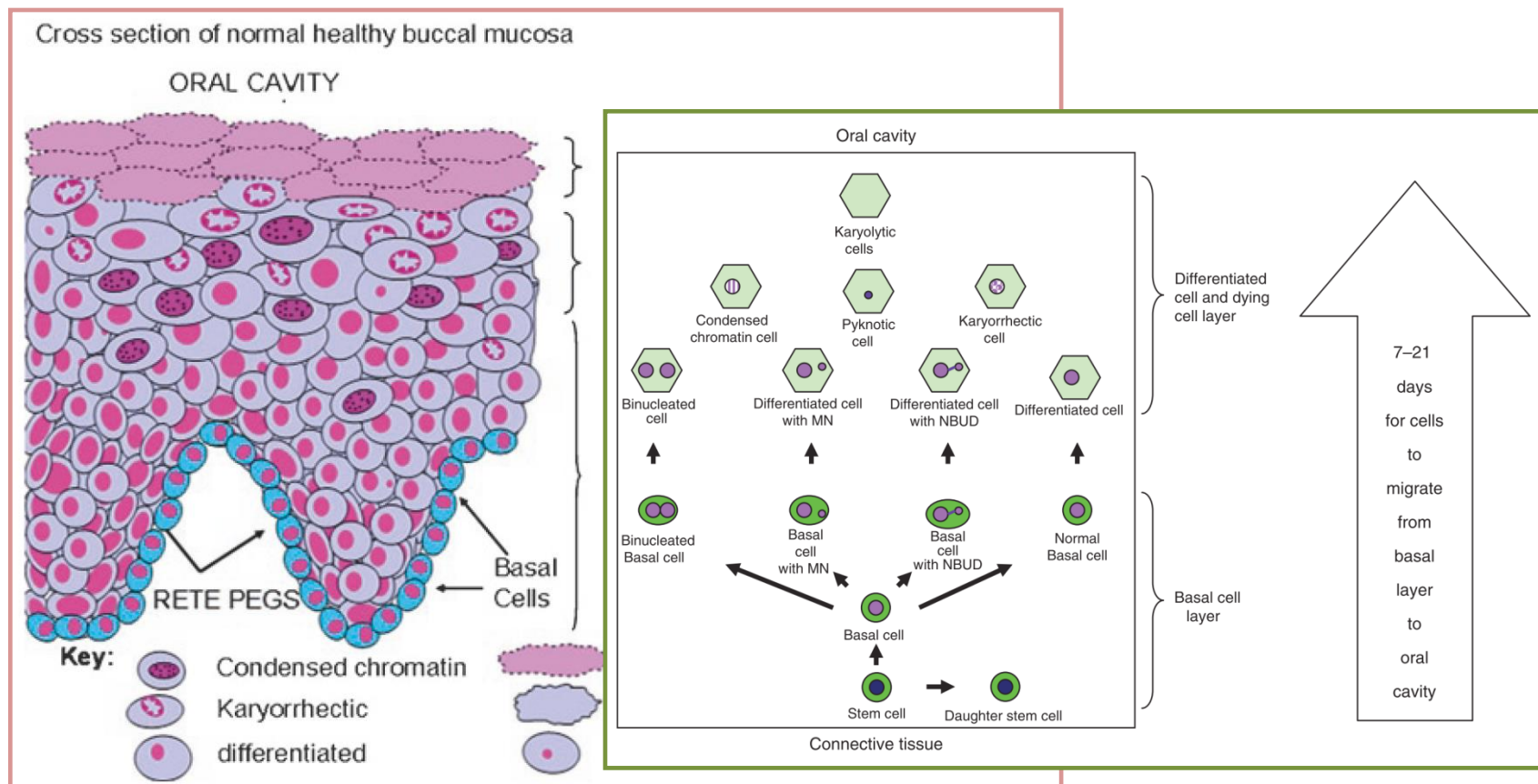
Delezione + "Gap"



Interscambio

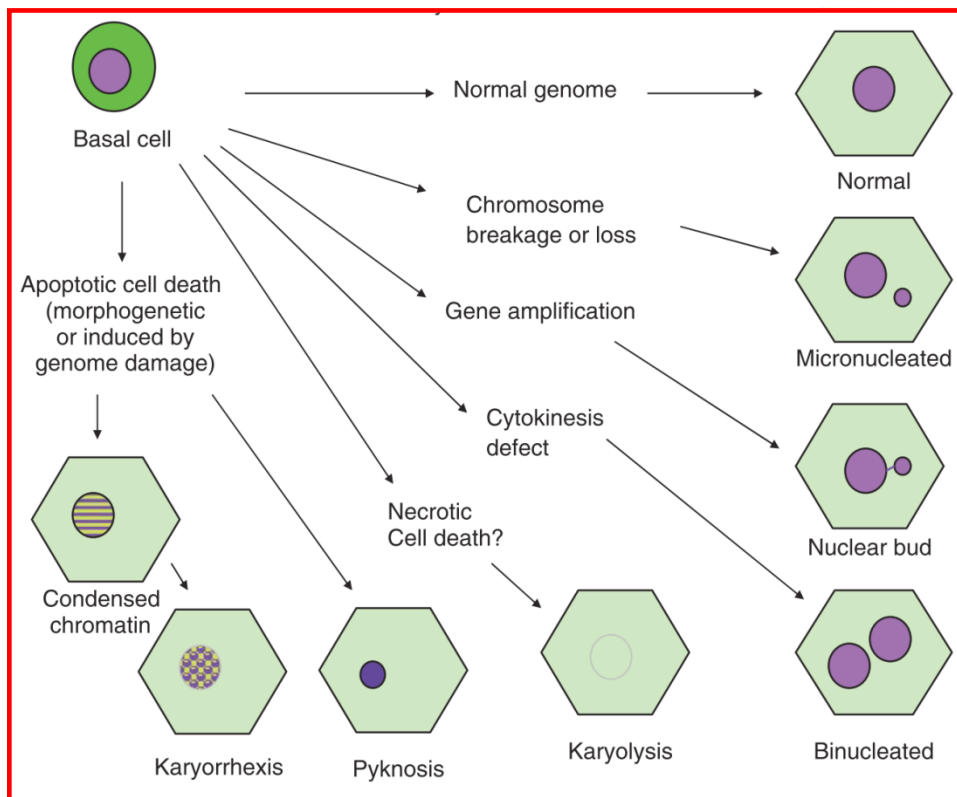
# Test del Micronucleo

- Alterazioni citogenetiche (MN) in cellule esfoliate della mucosa buccale:

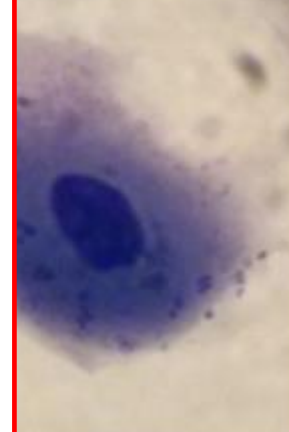


# Test del Micronucleo

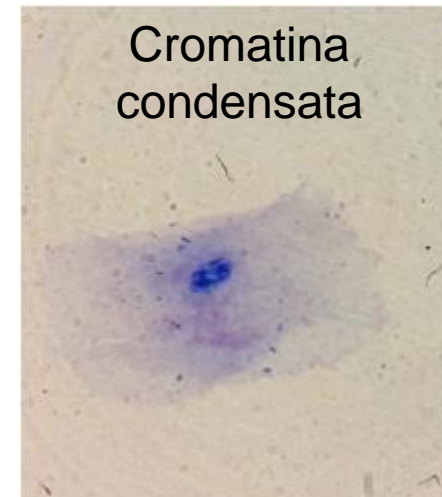
## □ Buccal Cytome assay:



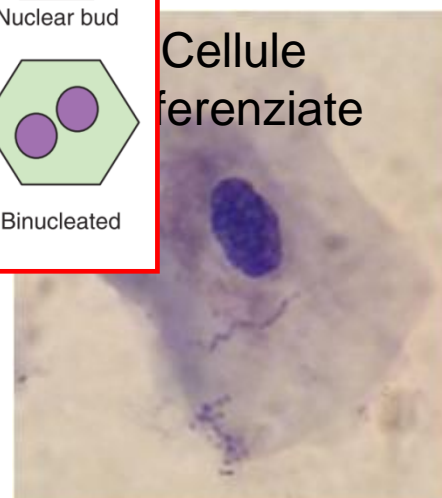
Cellule basali



Cromatina condensata



Cellule differenziate



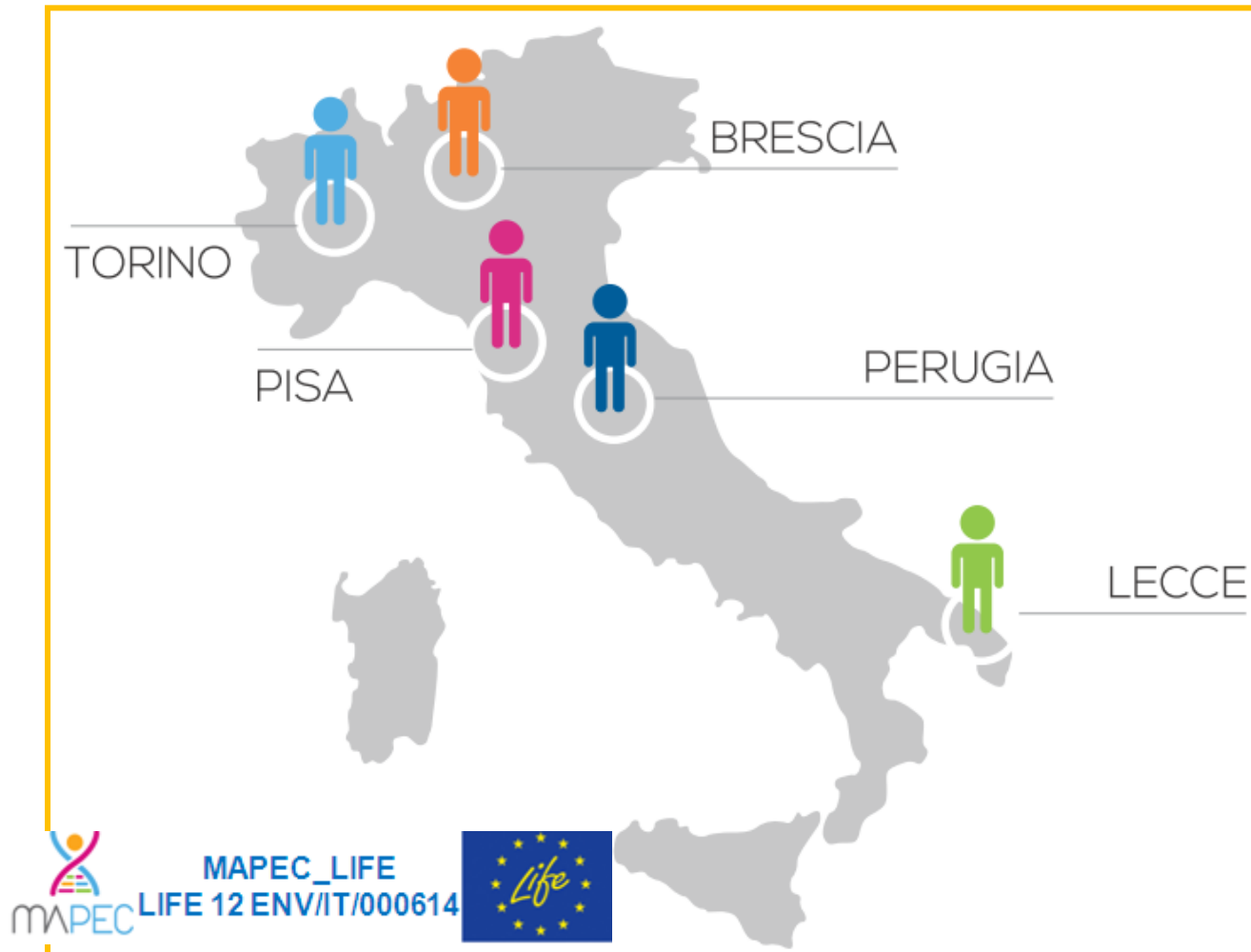
Carioretiche





# MAPEC: Studio multicentrico

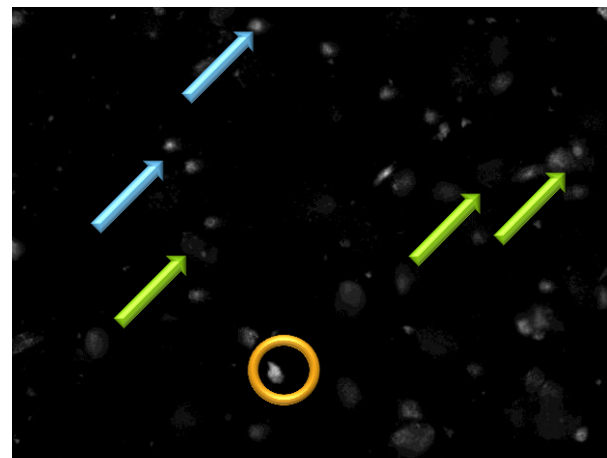
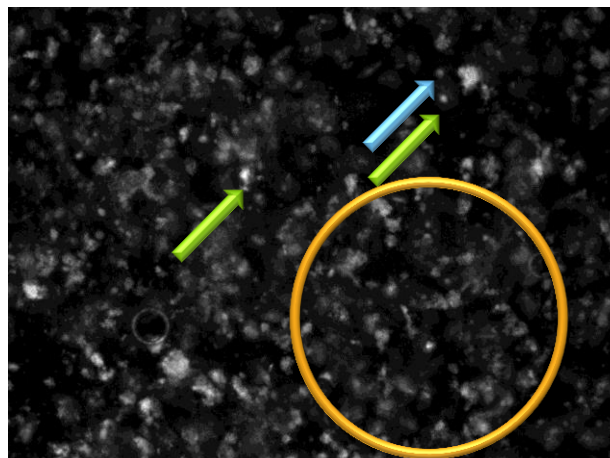
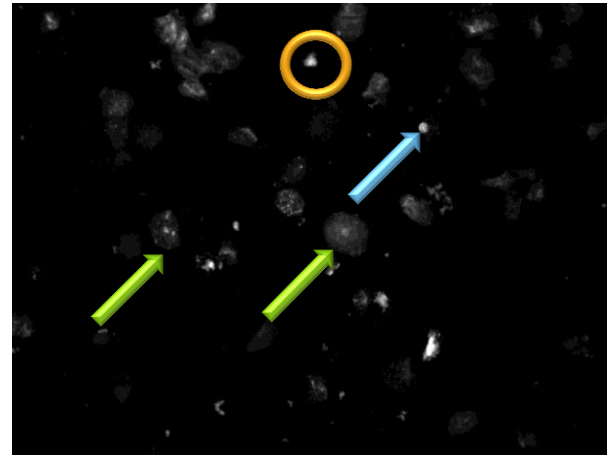
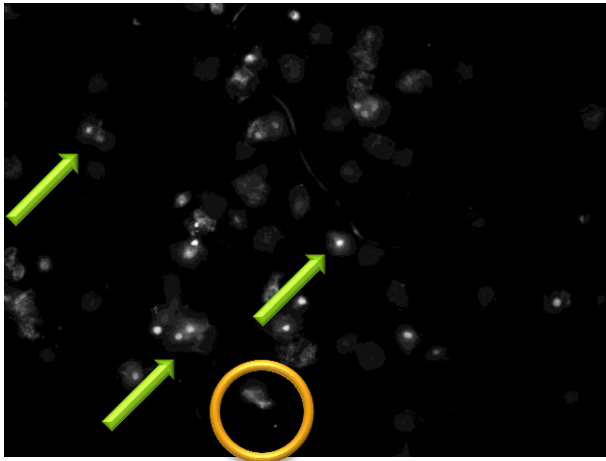
□ Cinque città coinvolte:



# MAPEC: Fasi della Ricerca



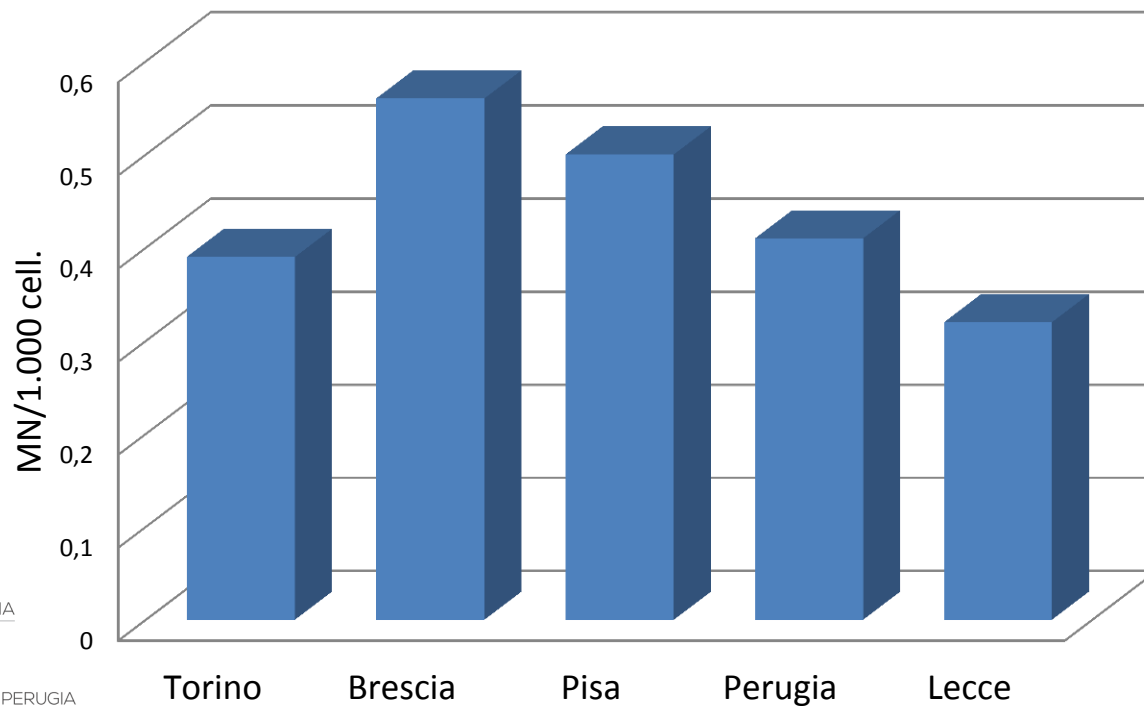
## Comet Assay ...



- Linfociti
- Cellule della mucosa buccale
- Impurità

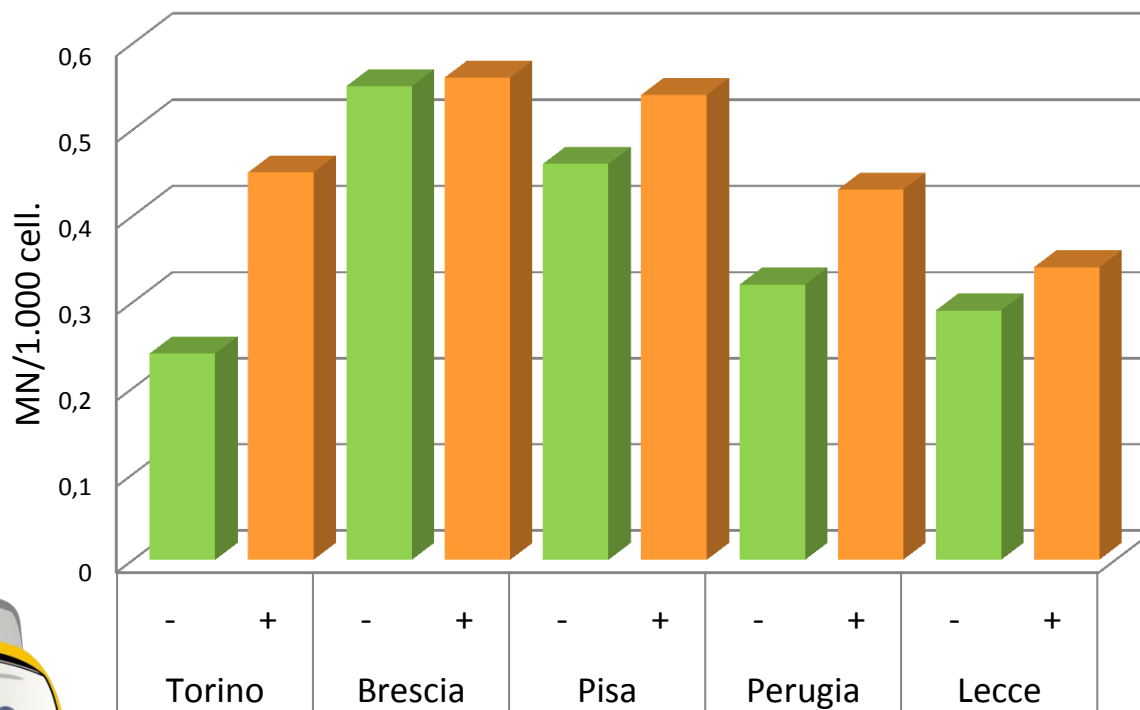
# Risultati Preliminari

□ MN → totale bambini:



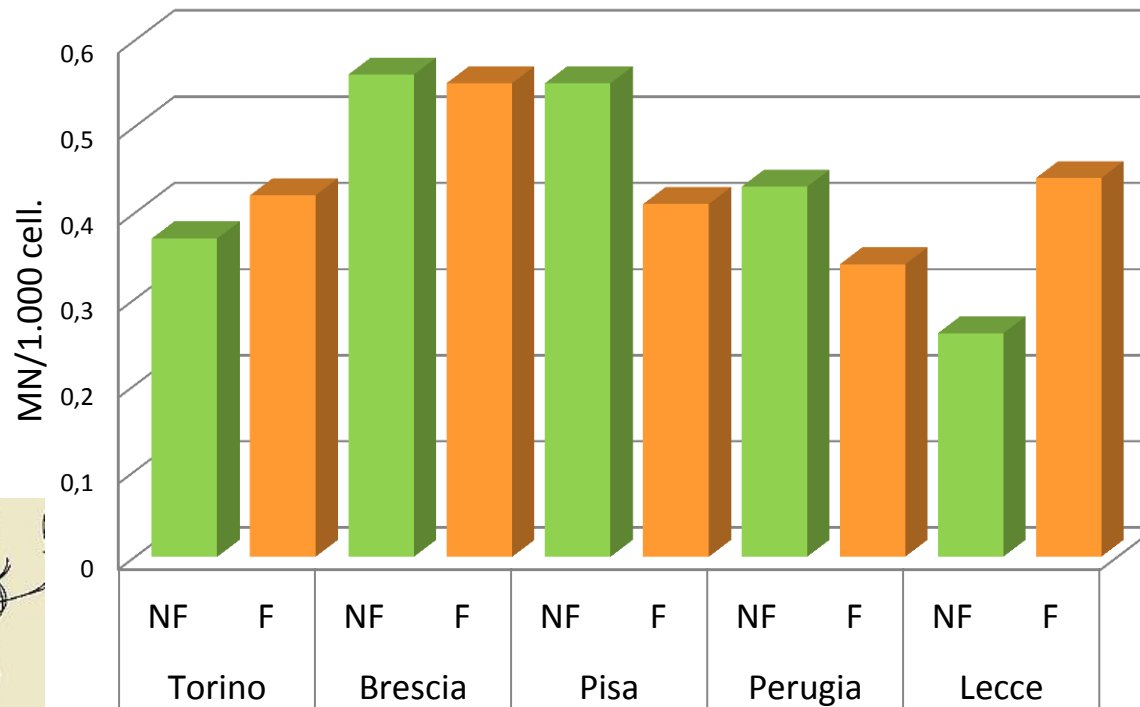
# Risultati Preliminari

□ MN → traffico autoveicolare (basso/alto):



# Risultati Preliminari

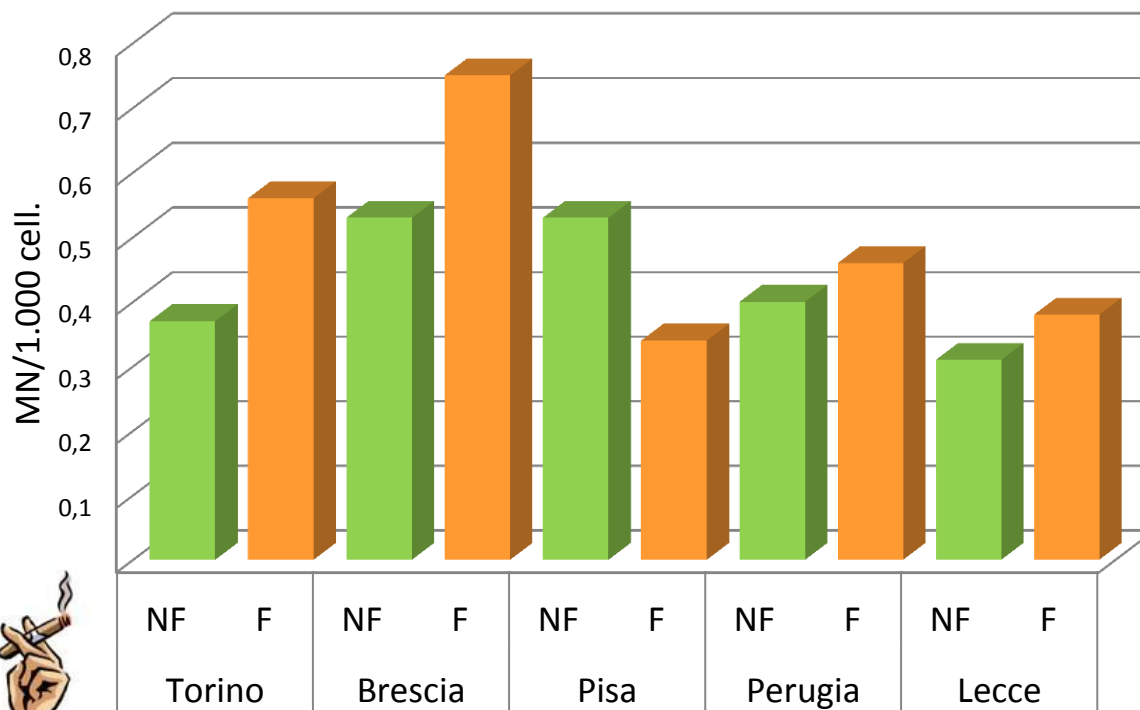
□ MN → genitori (almeno 1) fumatori:





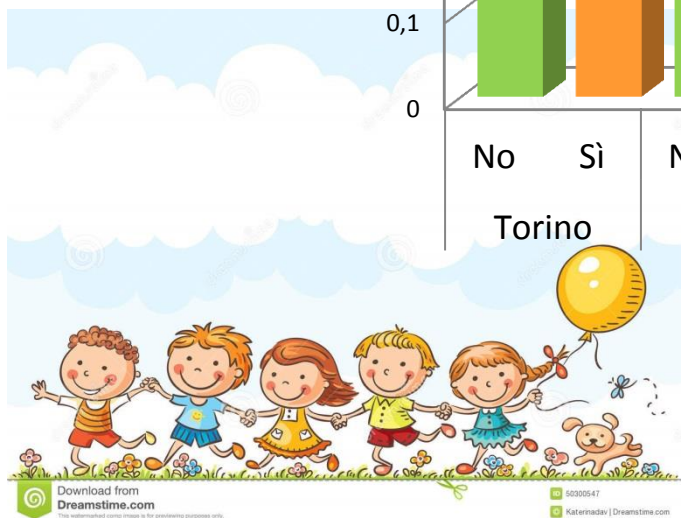
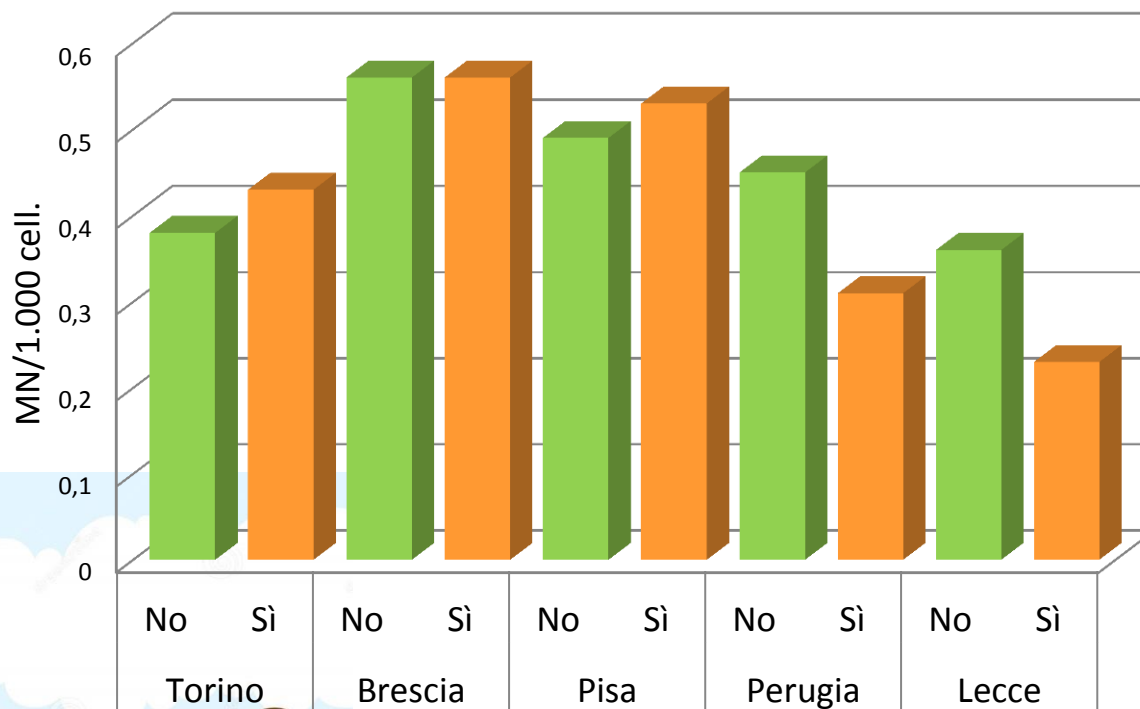
# Risultati Preliminari

□ MN → familiari (almeno 1) fumatori:



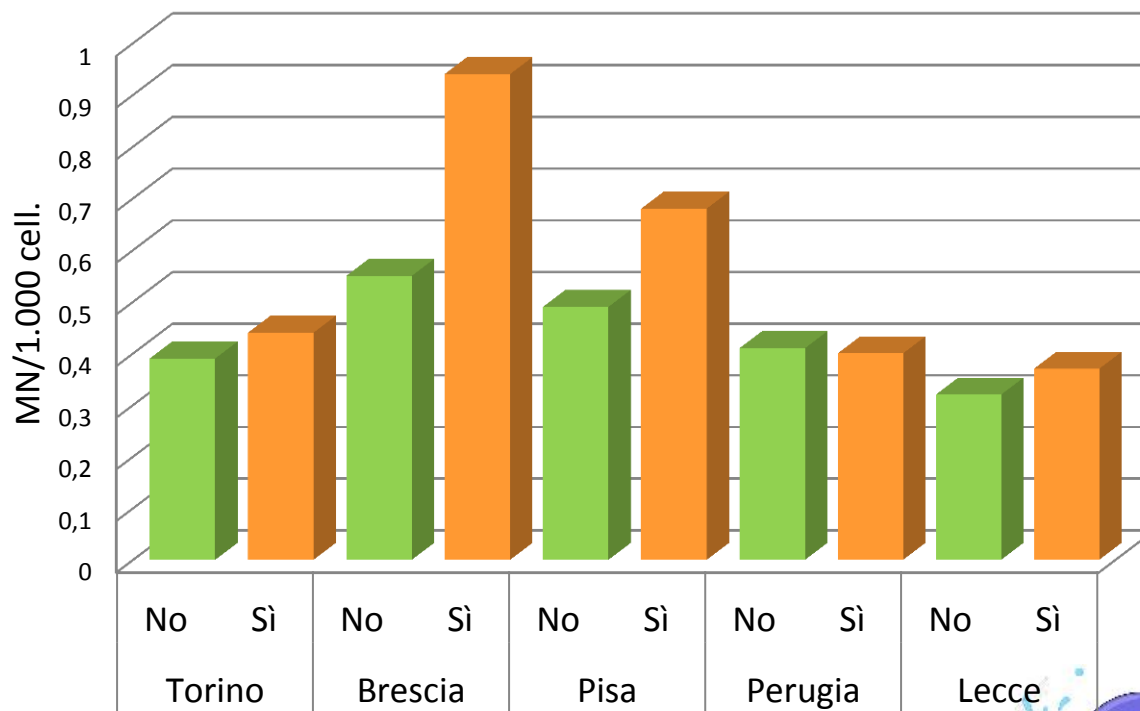
# Risultati Preliminari

□ MN → gioco quotidiano all'aria aperta (almeno 1 h):



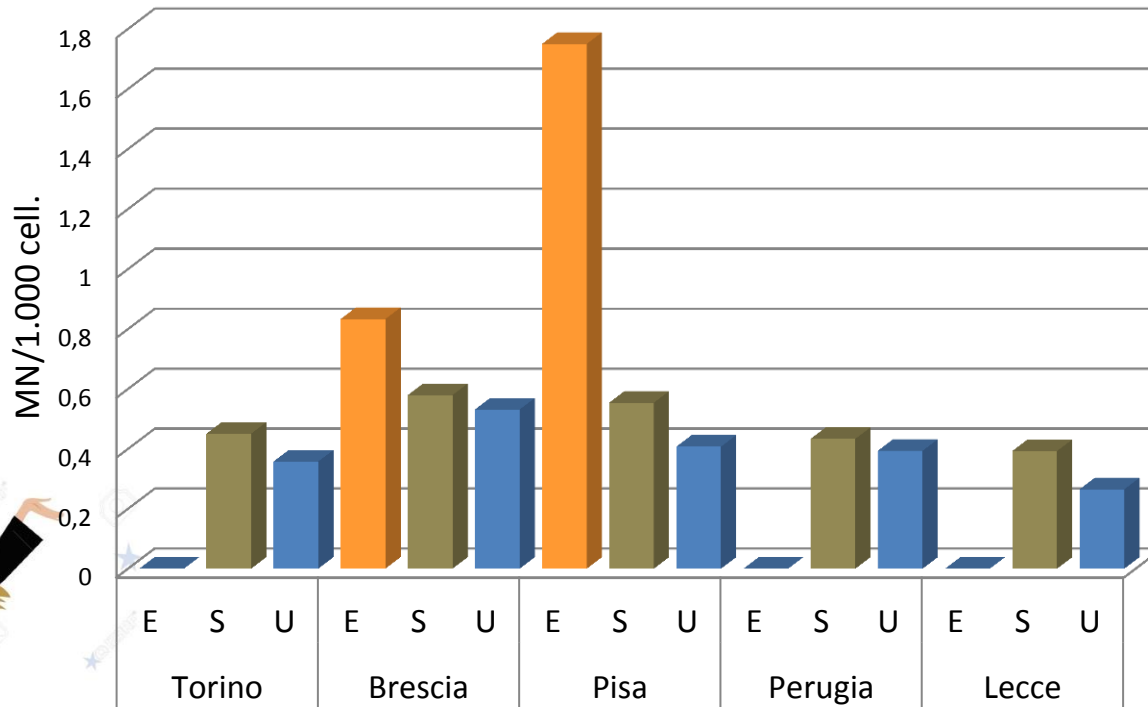
# Risultati Preliminari

□ MN → piscina (almeno 2/3 volte/settimana):



# Risultati Preliminari

□ MN → titolo di studio genitori (E=elementare; S=superiore):



# Conclusioni



MONITORAGGIO DEGLI EFFETTI  
DELL'INQUINAMENTO ATMOSFERICO  
SUI BAMBINI A SUPPORTO  
DELLE POLITICHE DI SANITÀ PUBBLICA



## PUBBLICO

Sei un cittadino?  
Tieniti informato: segui  
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dedicato al mondo  
dell'informazione e agli enti.



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Accedi all'area dedicata  
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## □ Dipartimento di Scienze Farmaceutiche

### Staff members:

- Prof. Silvano Monarca - *Local Project Leader*
- Prof. Massimo Moretti
- Dott. Milena Villarini
- Dott. Sara Levorato
- Dott. Tania Salvatori
- Dott. Samuele Vannini
- Sig.ra Cristina Fatigoni



**GRAZIE**  
**PER L'ATTENZIONE**

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