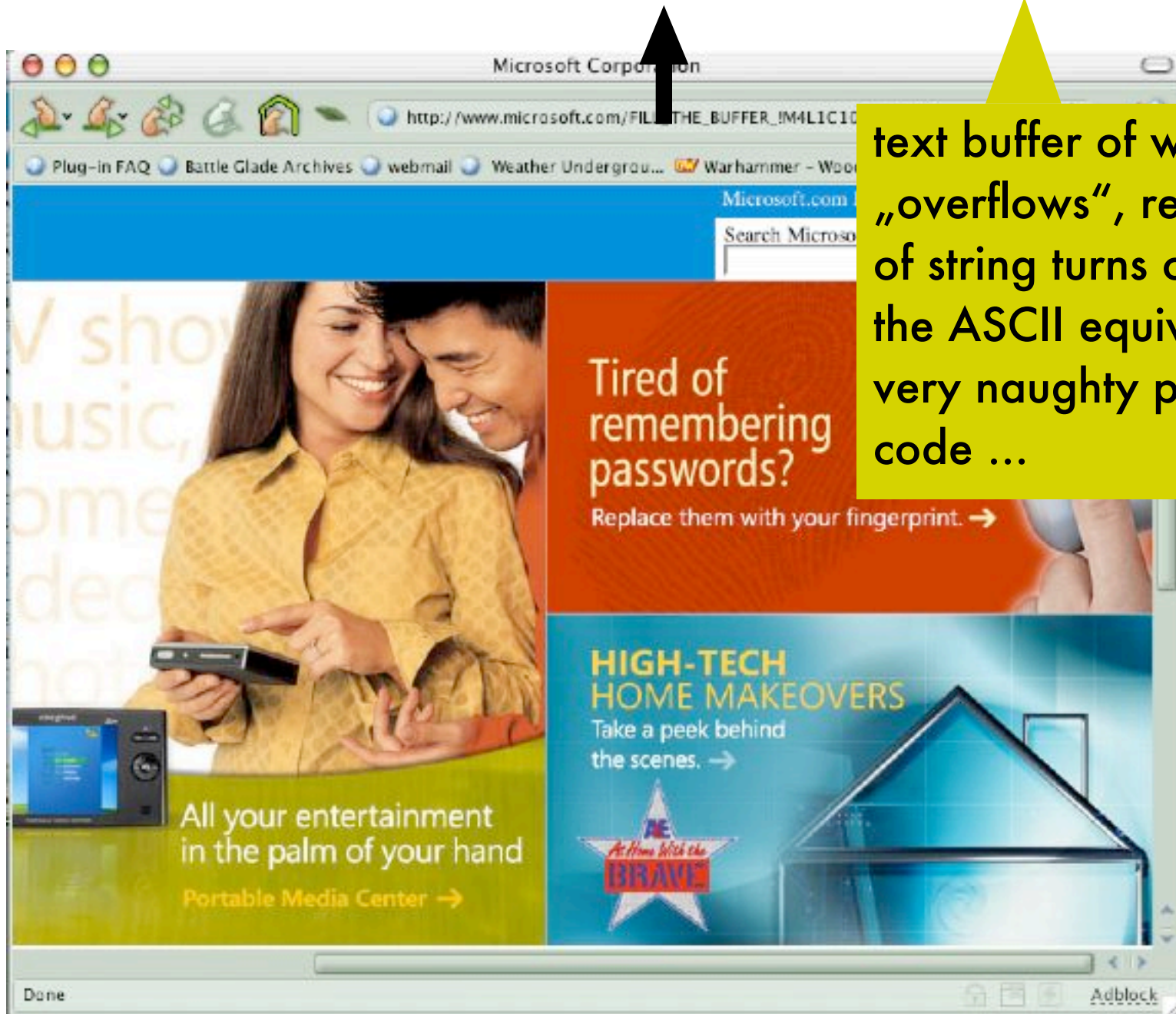


# 21C3: Sexual Salvation

how complex carbon based lifeforms  
protect themselves against pathogens  
and what computers can learn from them

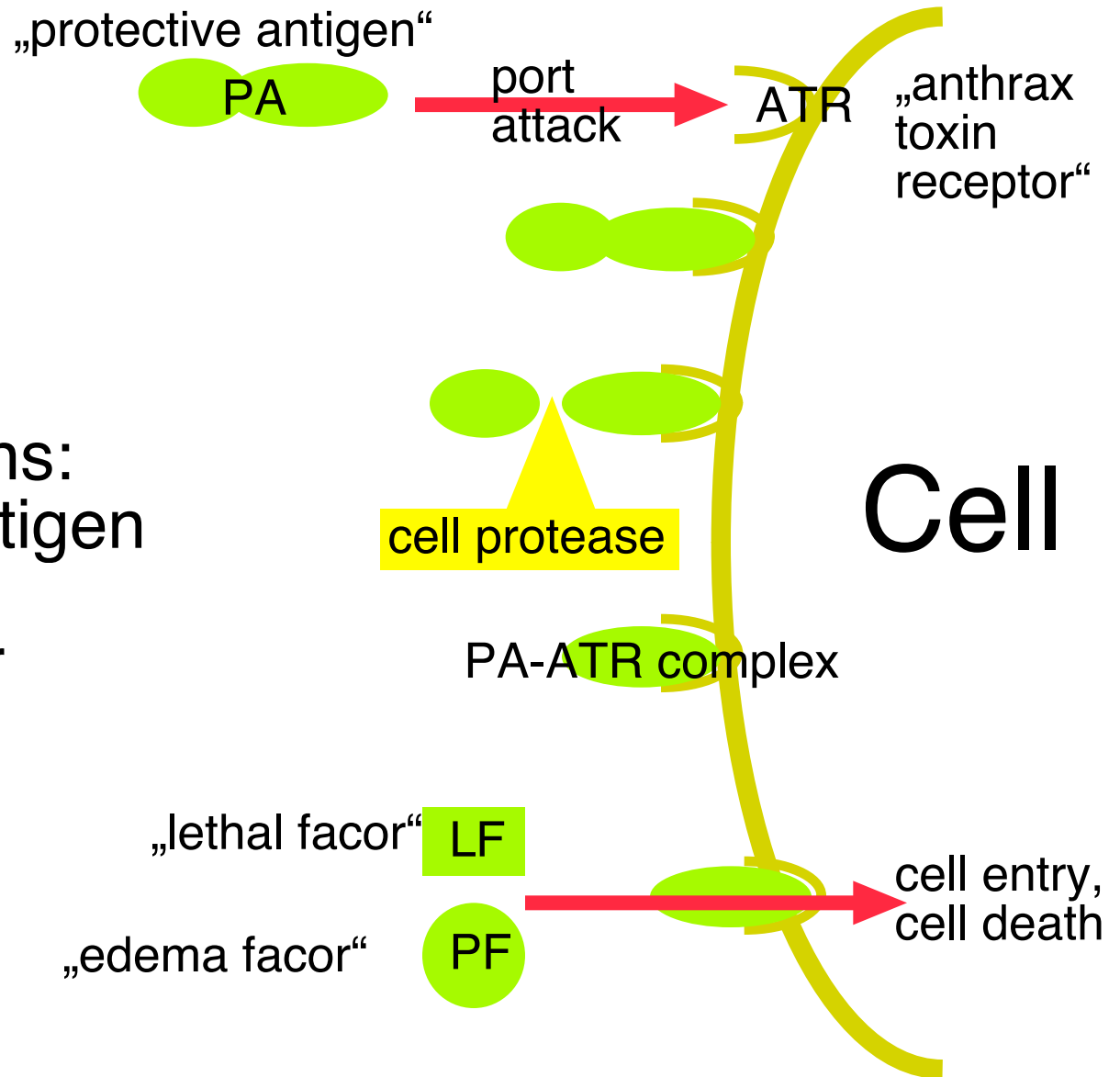
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`http://www.microsoft.com/FILL_THE_BUFFER___#EVIL_COD3#`



text buffer of webserver „overflows“, remainder of string turns out to be the ASCII equivalent of a very naughty piece of code ...

- 3 Anthrax toxins:
- protective antigen
  - lethal factor
  - edema factor



# The Problem ...

- evolutionary pressure through pathogens, especially viruses with their high mutation rate, leads to a biological arms race between host and pathogens
- our major natural line of defence is our immune system
- a critical factor of our immune system is antibody diversity, which is coded on six genetic loci, three received from the father and three from the mother
- how can we as a species keep up genetic diversity, essential in our eternal battle against pathogens?

# ... HAVE SEX\* !!!

- \* only sexual reproduction as opposed to cloning (bacteria), off-shoots (plants) or parthenogenesis (plankton) facilitates a thorough mixing of genetic material.
- mixing is achieved through:
  - random partner selection
  - random re-shuffling of genetic material within each partner (meiosis)
- The technical details of this evolutionary strategy are hidden under a sophisticated pleasure rewarding application layer, driving most of today's societies
- To fight viruses more effectively, computers need to have sex, i.e. mix their code
- enjoy 21C3, fight the viruses