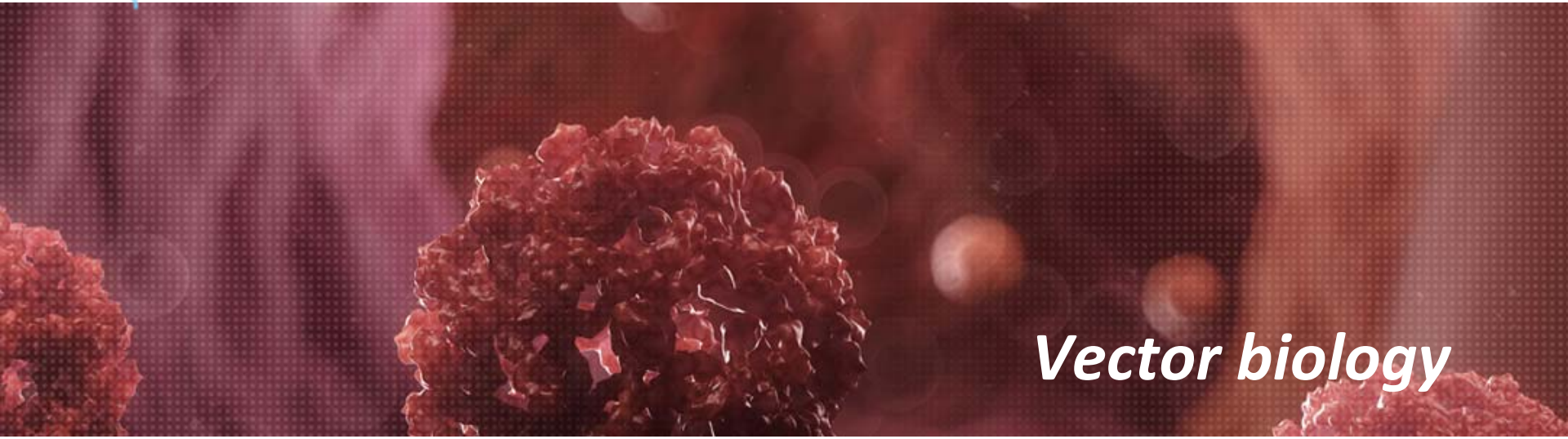
VICTORIE



Vector biology

COOPERATION

COORDINATED BY THE VIROSCIENCE LAB OF ErasmusMC

Vector biology

VECTORIE addresses the need for adequate prediction and surveillance of WNV and CHIKV outbreaks in Europe by generating novel knowledge on avian and mammalian host susceptibility and vector competence of the two main vectors of WNV and CHIKV (*Culex pipiens* and *Aedes albopictus*, respectively). These studies combined will lead to important insights necessary for determining the type of surveillance system appropriate for European countries to detect and predict emerging WNV and/or CHIKV outbreaks. It will allow for the development of a surveillance and response plan to deal with the risk of WNV and CHIKV introduction in unaffected countries.

Tasks for vector biology

Comparing the susceptibility of European crows to several WNV lineages circulating in Europe

It is assumed that European birds are generally less susceptible to infection with WNV as compared to their North American counterparts. It is important to understand why most outbreaks in Europe were not preceded by mortality in birds, as they were in the US. VECTORIE will expand the current knowledge of the mechanisms that govern virulence in birds between different WNV lineages circulating in Europe, thereby providing an important piece of information regarding the risk of their spreading potential and potential to cause outbreaks of human disease. This task will address the questions how a virulent WNV strain will behave in European members of the *Corvidae* family (crow and jackdaw) and why outbreaks in Europe were not preceded by mortality in these birds, which did occur in North America.

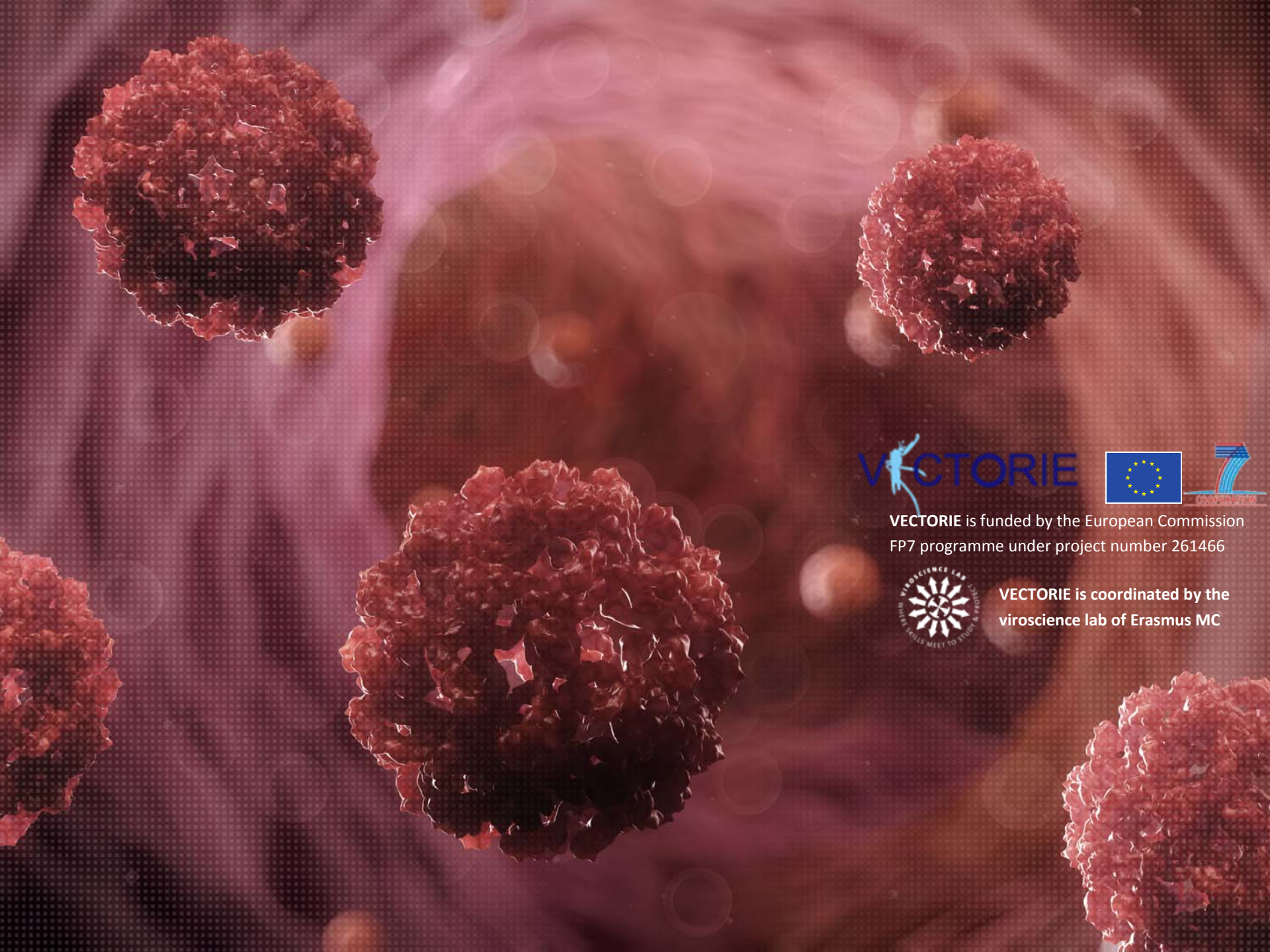
Vector biology

Study of vector competence of Culex pipiens mosquitoes for several lineages of WNV

Current WNV and CHIKV control strategies are based largely on vector control. The risk of WNV and CHIKV outbreaks in humans is not only determined by vector competence but also by their feeding behaviour. These factors have so far not been investigated for European vectors. It is not known whether European *Culex pipiens* mosquitoes transmit WNV to animals or humans. Therefore, defining vector competence and feeding behavior is essential in formulating and focusing a prevention plan. *Culex pipiens* mosquitoes will be used for studies on vector competence and compared to WNV-competent *Culex pipiens* from the US.

Study of vector competence of Aedes albopictus mosquitoes for CHIKV at low temperature

Northward migration and increasing numbers of air transports, combined with the ability of *Ae. albopictus* to adapt to different ecological situations allows for the permanent introduction of this mosquito species in large parts of Europe. Authoritative climate scenarios for the near future predict that many parts of Europe will become warmer and wetter. These changes are likely to impact the risk of CHIKV outbreaks in those parts of Europe. The question remains, however, whether *Ae. albopictus* will be able to efficiently transmit pathogenic CHIKV among the human population in temperate climate zones. Temperature has a significant effect on the replication of arboviruses in mosquitoes. The effect of temperature on vector competence of *Ae.albopictus* for CHIKV will be determined in mosquito populations of different origins. These studies will yield important indicators to predict the risk for CHIKV epidemics upon establishment of *Ae. albopictus* in Europe, which is pivotal for the development of a surveillance and response plan to deal with the risk of CHIKV introduction hitherto in unaffected countries.



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