



**FP6-016039**

# **CILIA**

## **Customized Intelligent Life-Inspired Arrays**

Integrated Project

Information Society Technologies  
Future & Emerging Technologies  
Proactive Initiative BIO-I3

### **DELIVERABLE: D2.1.4 – Executive Summary**

RECEPTIVE FIELD PROPERTIES OF AFFERENT  
NERVE FIBRES IN RESPONSE TO DIPOLE STIMULI

<b>Actual submission date:</b>	March 1, 2008	
<b>Start day of project:</b>	September 1st, 2005	<b>Duration:</b> 48 months

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## RECEPTIVE FIELD PROPERTIES OF AFFERENT NERVE FIBRES IN RESPONSE TO DIPOLE STIMULI

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executive summary

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### EXECUTIVE SUMMARY

Using extracellular single cell recordings, we investigated how fibres in the posterior lateral line nerve of goldfish, *Carassius auratus*, respond to sinusoidal water motions generated by a stationary vibrating sphere. These fibers innervate neuromasts on the surface and within the canal of the fish trunk. The location of the sphere alongside the fish body was altered in order to obtain spatial excitation patterns, i.e. to determine receptive field shape and size. In addition, the direction of sphere vibration was altered in order to investigate the effects of changing the relative orientation between source (vibrating sphere) and receiver (neuromast) on the spatial excitation patterns. Changes in sphere location and vibration direction resulted in altered neurophysiological response patterns, i.e. the spatial excitation patterns changed in a predictable manner. These changes were consistent with those predicted from models based on pressure gradient and velocity distributions across the fish's surface. By comparing the response patterns obtained with different vibration directions, our data allow to reconstruct the actual orientation of the neuromast on the fish's surface that was innervated by the recorded fibre.