



European
Research
Council



ERC Consolidator grant ARTTOUCH

Neurophysiologie du toucher: Approche par la microneurographie

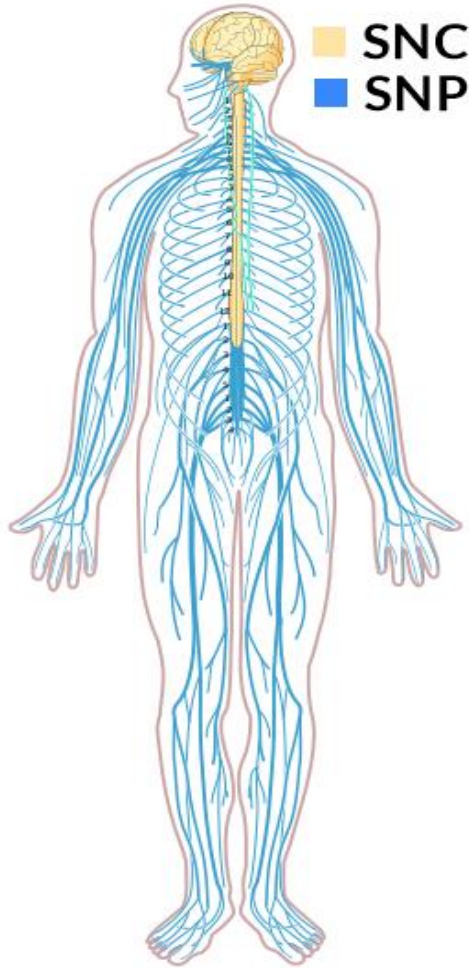
Mariama Dione

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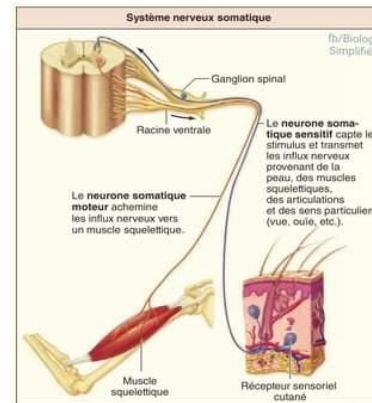


Le système nerveux: un système de transmission de l'information

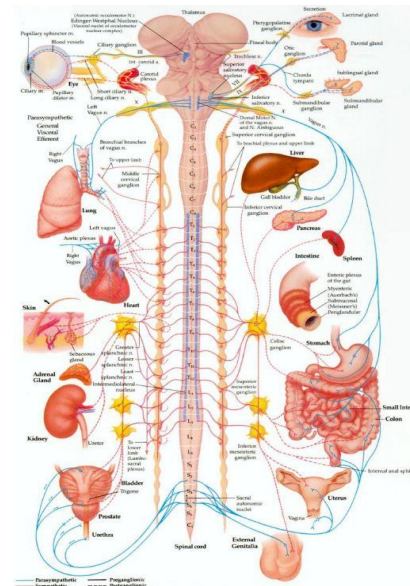
Somatique



fr.khanacademy.org

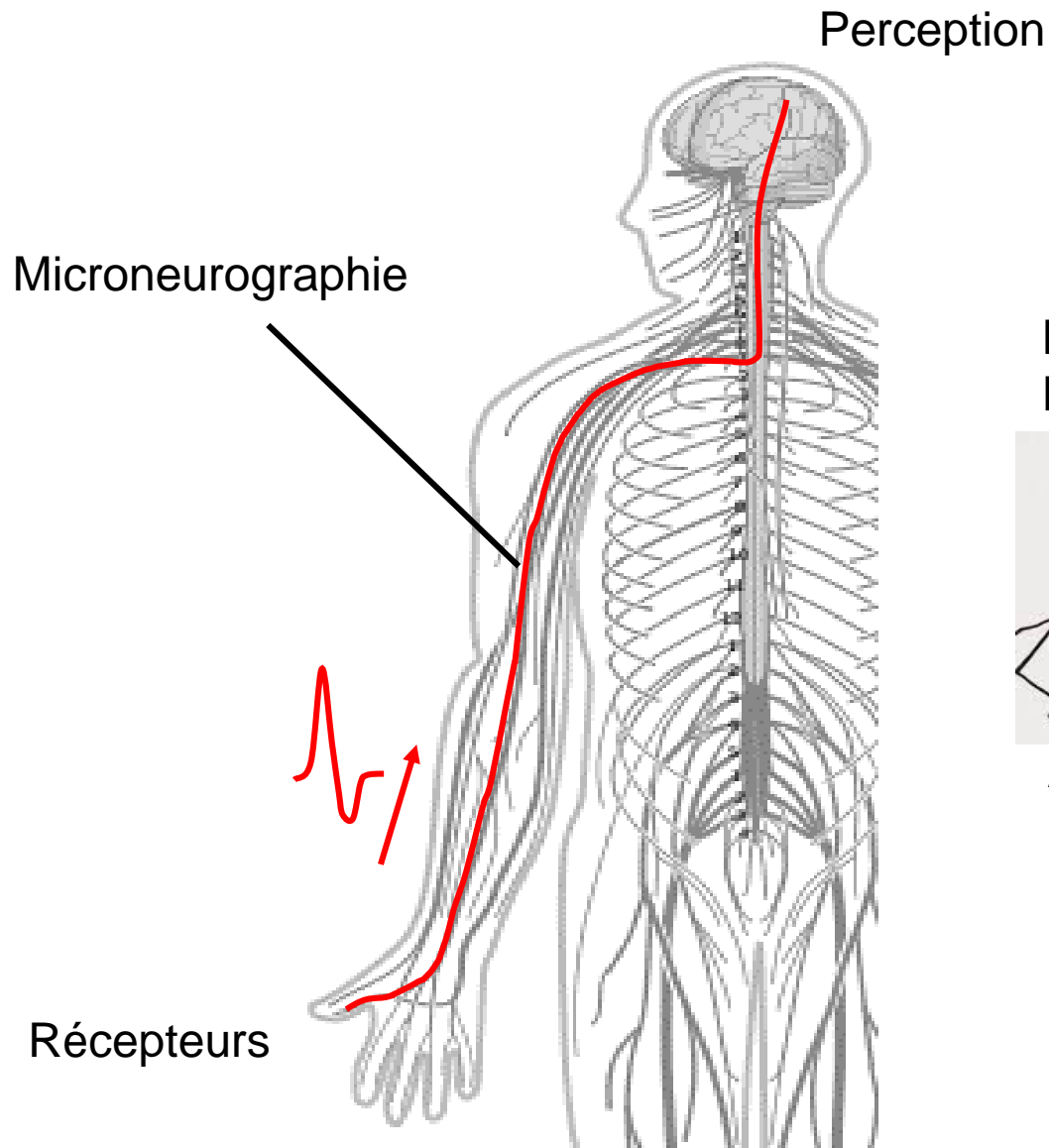


Autonome ou végétatif

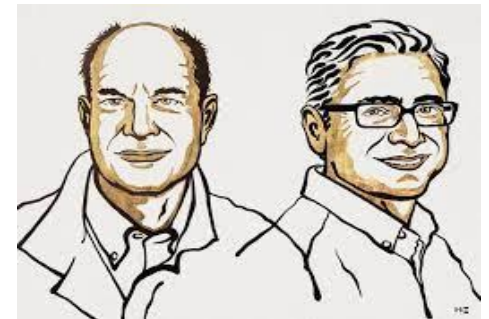


www.orthodiet.org

Transmission de l'information de la peau au cerveau



Mechanotransduction
Nobel 2021

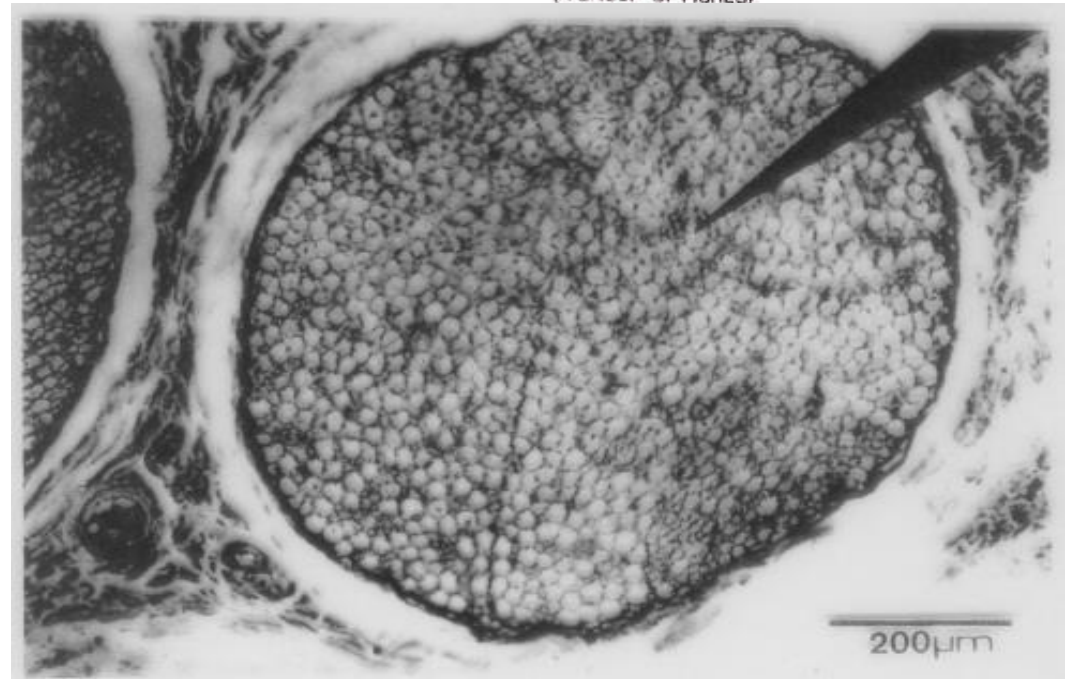
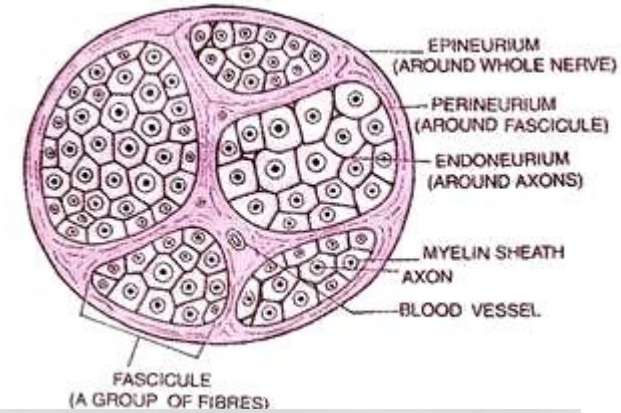
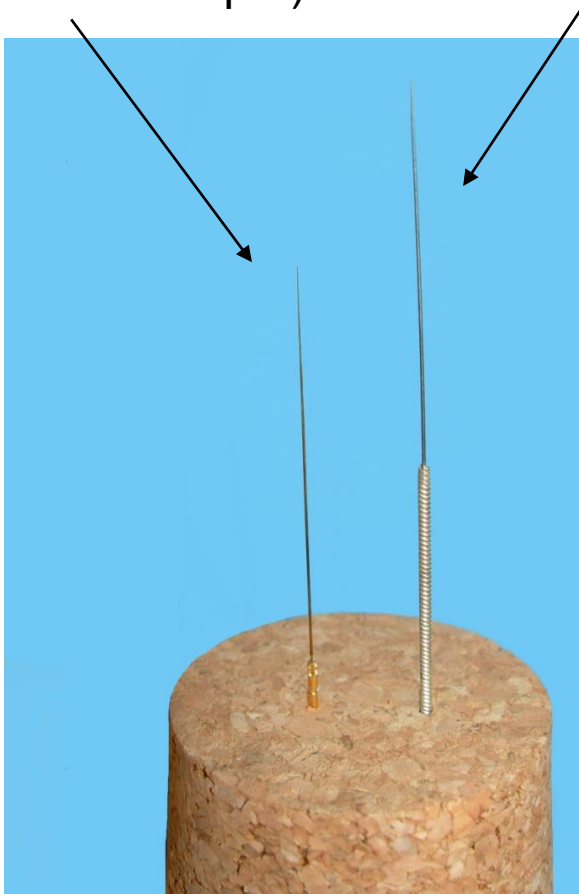


Ardem Patapoutian
David Julius

La microneurographie pour évaluer la transmission des informations nerveuses afférentes

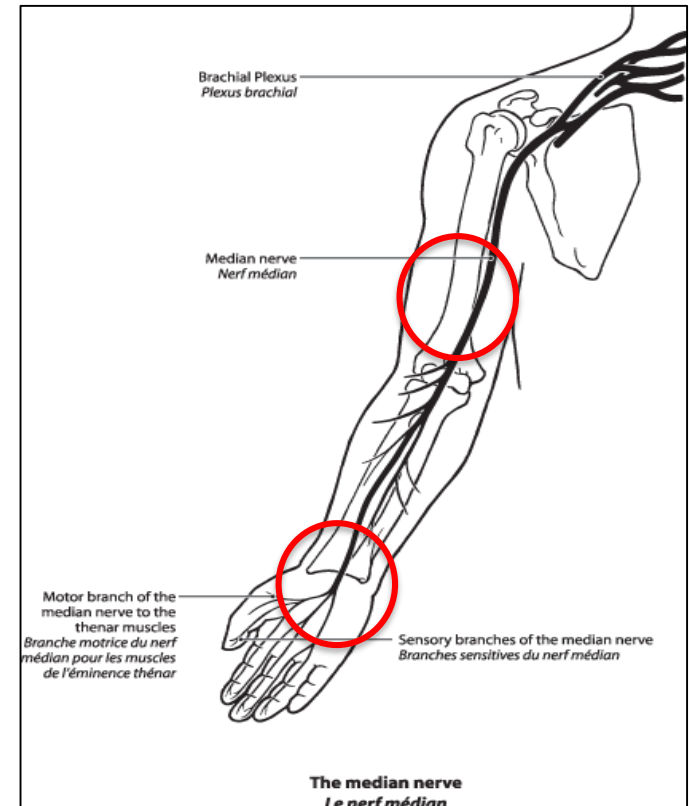
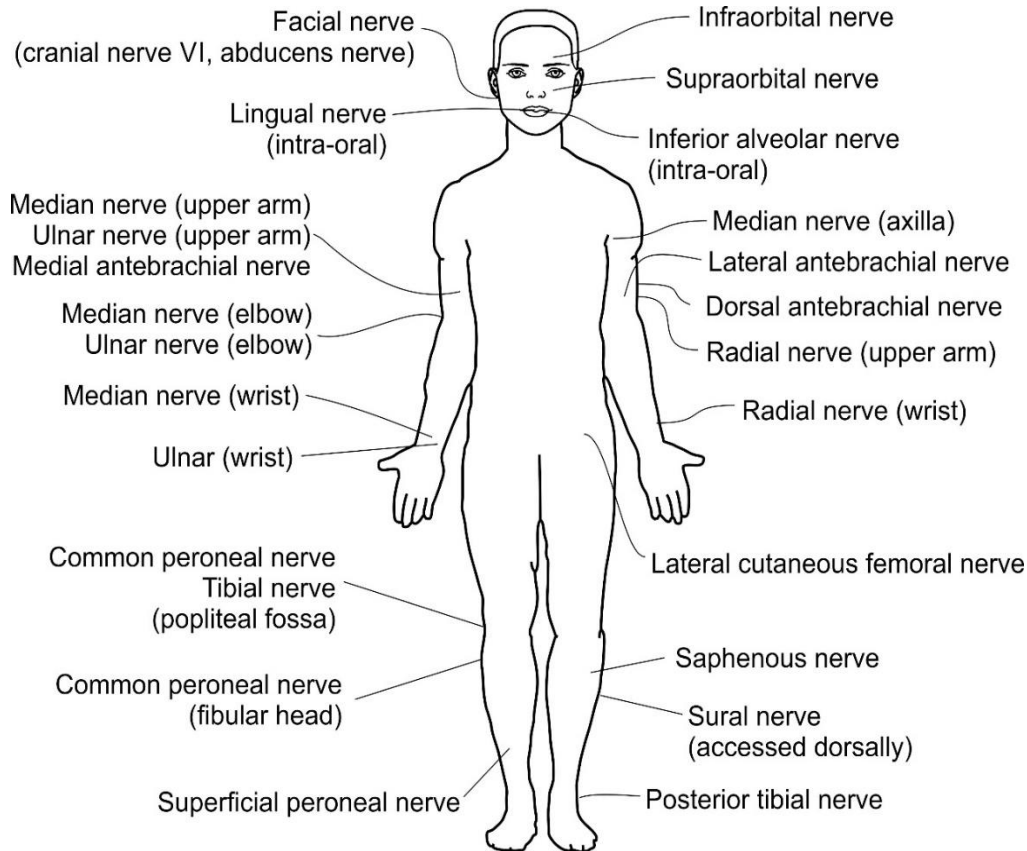
Microneurography
(0.2mm à ~5 μ m)

Acupuncture
(0.32 mm)



Bergenheim et al., 1999

La microneurographie pour évaluer la transmission des informations nerveuses afférentes



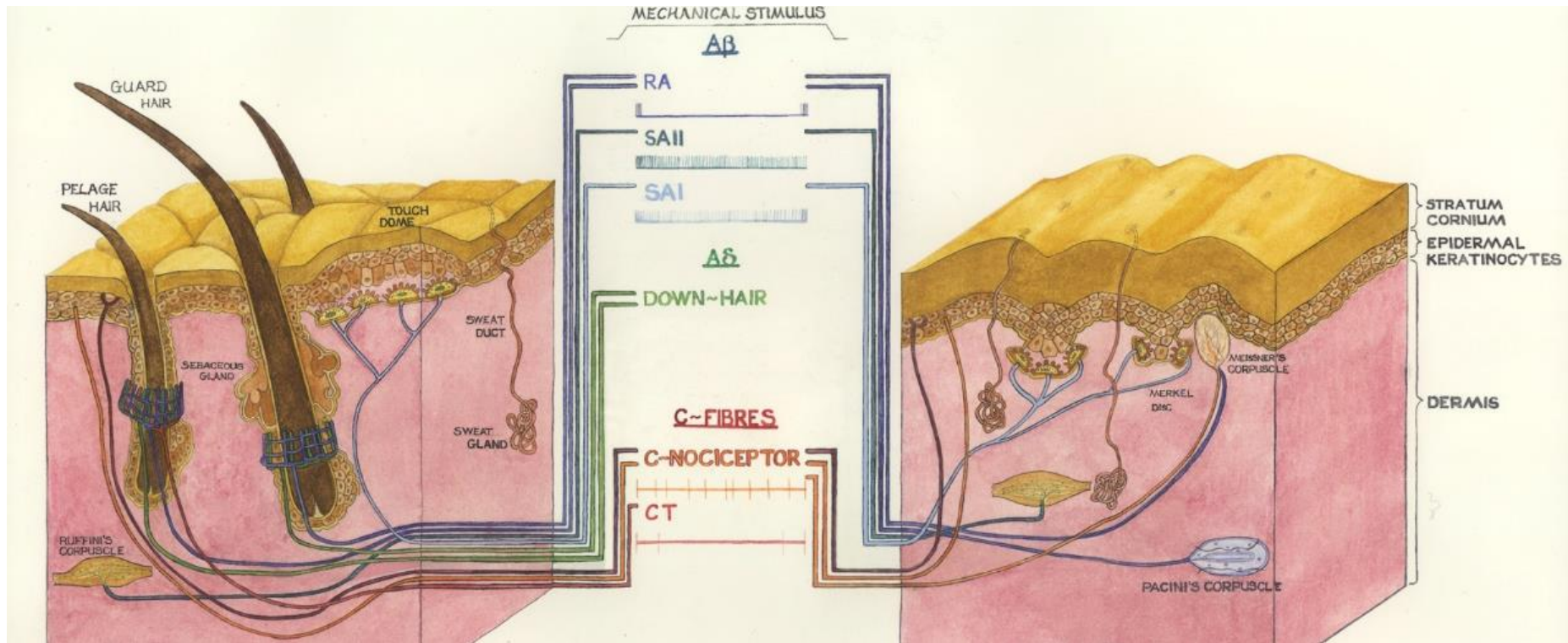
Nerfs explorés en microneurographie

Ackerley & Watkins, 2022

Les récepteurs dans la peau

Peau poilue

Peau glabre



Toucher affectif

Caresse, contact social,
Communication

Plutôt la **peau poilue**

Plutôt les **C-Tactiles**

(mais codent la valence du toucher,
pas le toucher lui même)



Toucher discriminatif

Lecture Braille, texture,
Manipulation d'objets, musique

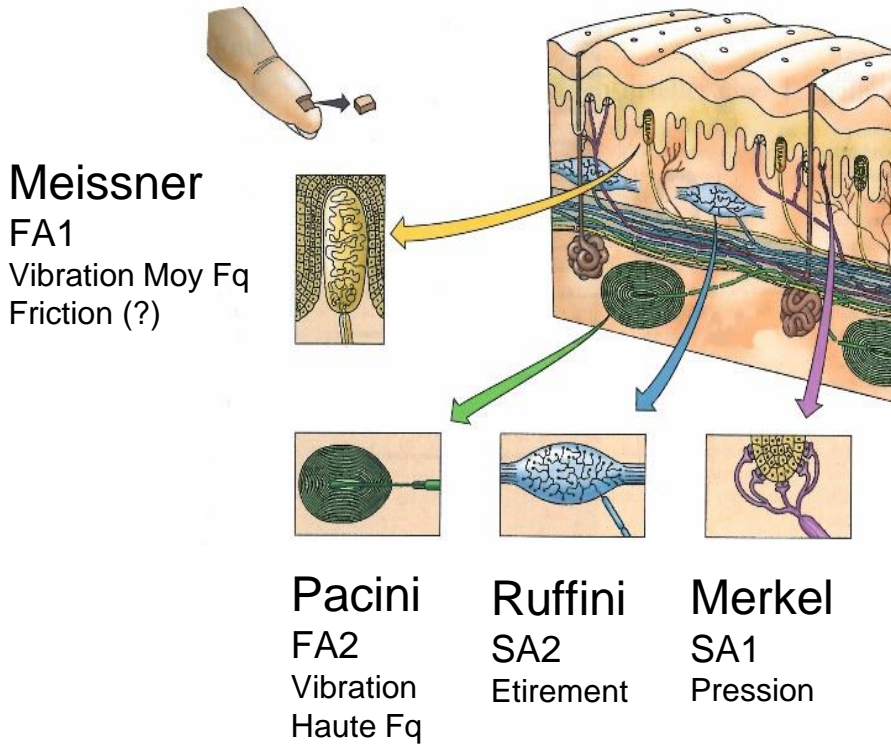
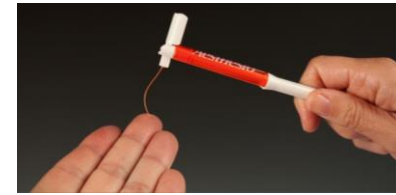
Plutôt la **peau glabre**

Plutôt les fibres **A- β**

(mais il y a des C-T dans la peau glabre!)



Le toucher discriminatif avec la main via les fibres A-β

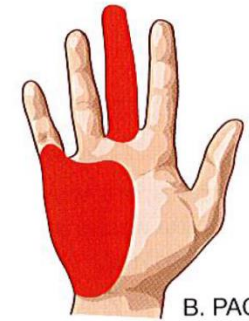


		Champs récepteurs	
		Petit	Large
Adaptation	Rapide	Meissner 	Pacini
	Lente	Merkel 	Ruffini



A. MEISSNER

~10 mm²

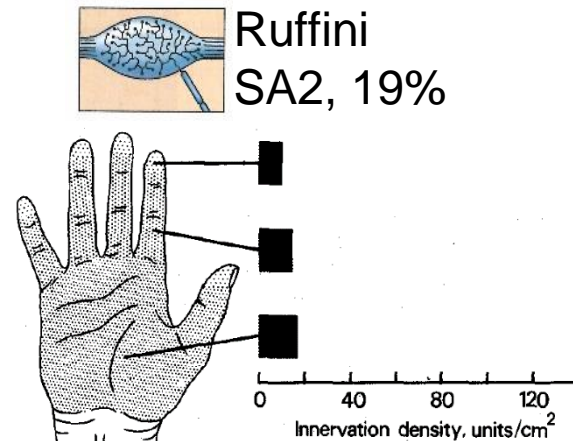
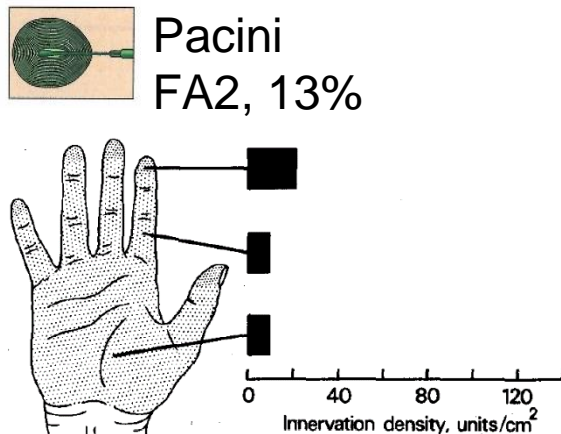
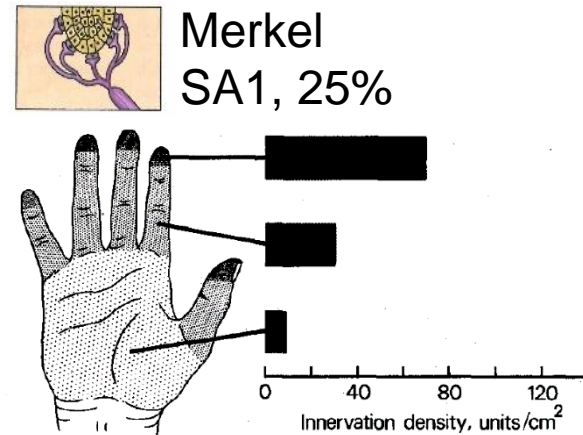
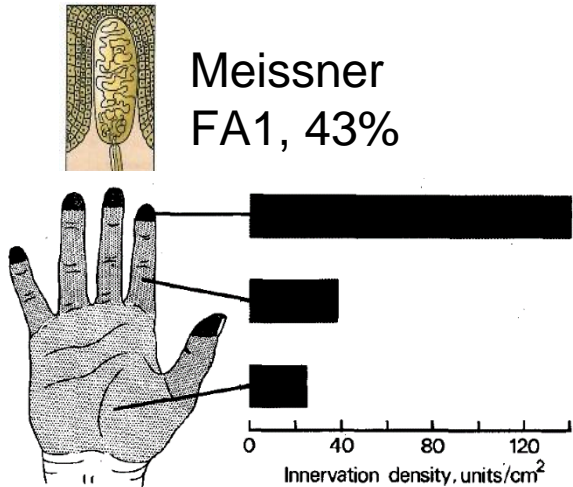


B. PACINI

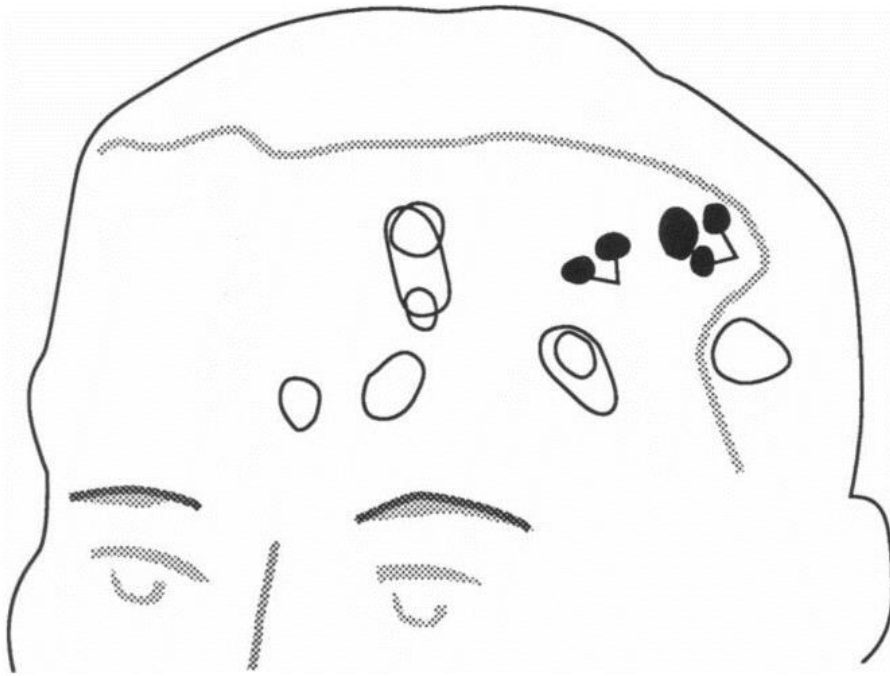
~100 mm²

Le toucher discriminatif avec la main: densité, répartition

17 000 mécanorecepteurs dans la peau glabre! (Johansson & Vallbo, 1979)



Le toucher affectif via les fibres C-T



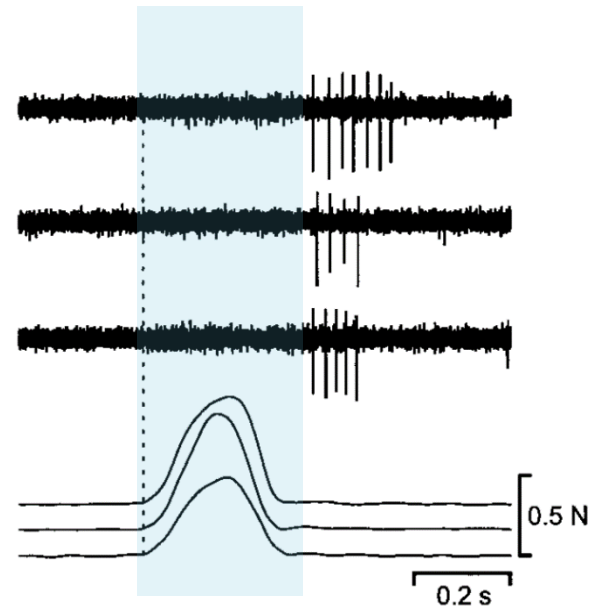
Champs récepteurs de CTs

~90 mm²,

En blanc CTs VF 5.5g

En noir VF 23g

Nordin, 1990



Conduction lente de l'information
Valbo et al., 1999, avant-bras

Au labo de microneuro

Confort



Equipe



Insérer l'aiguille



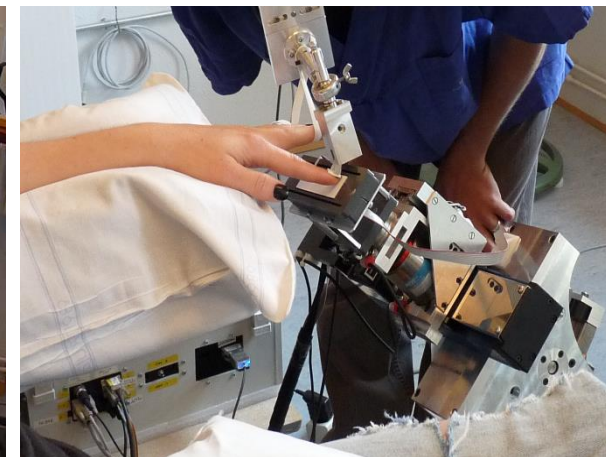
Trouver les fibres
Toucher mécanique



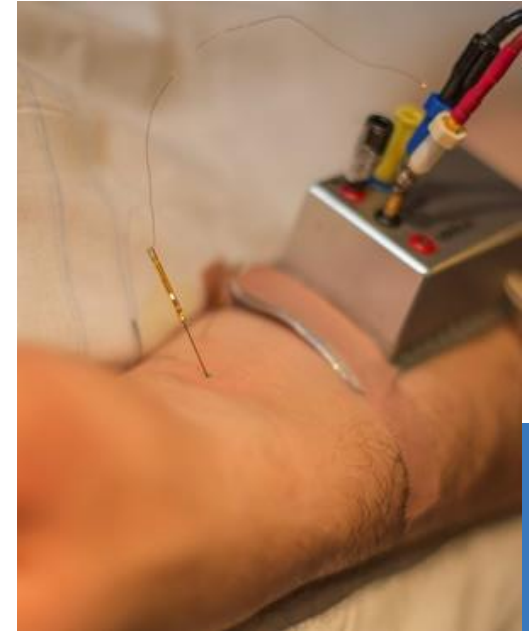
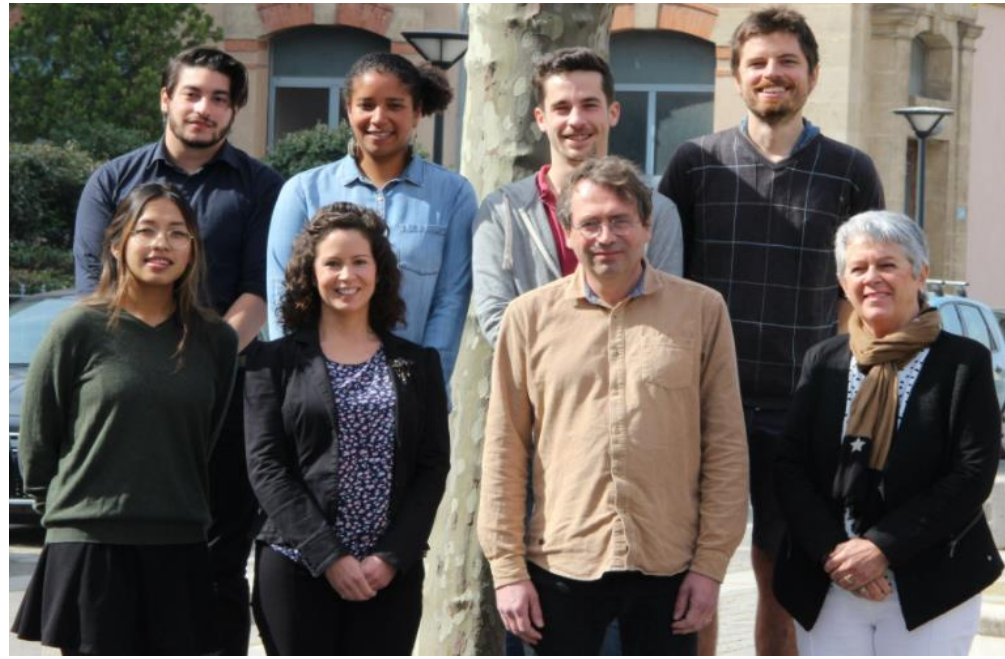
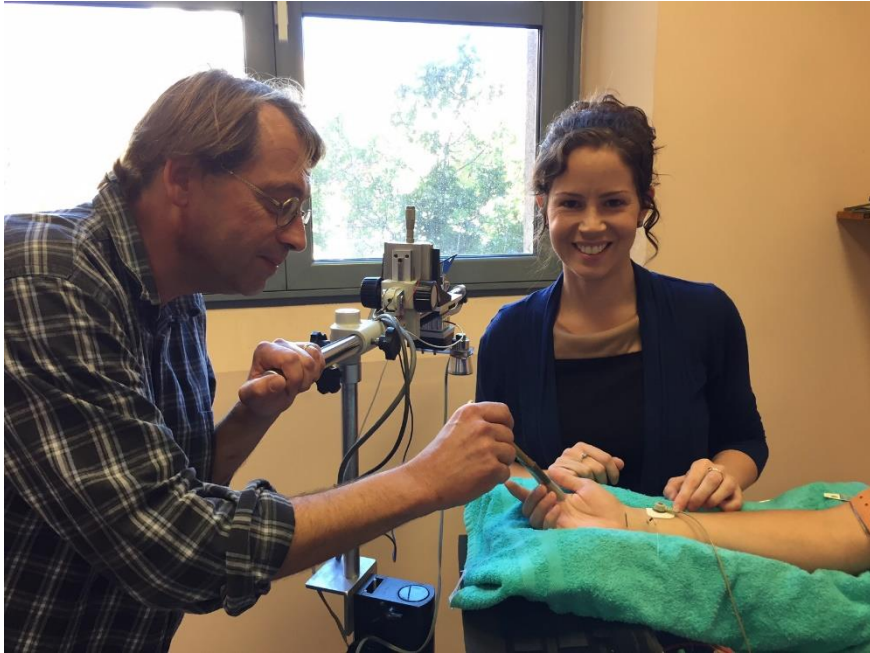
Les caractériser



Tester des hypothèses



Au labo de microneuro

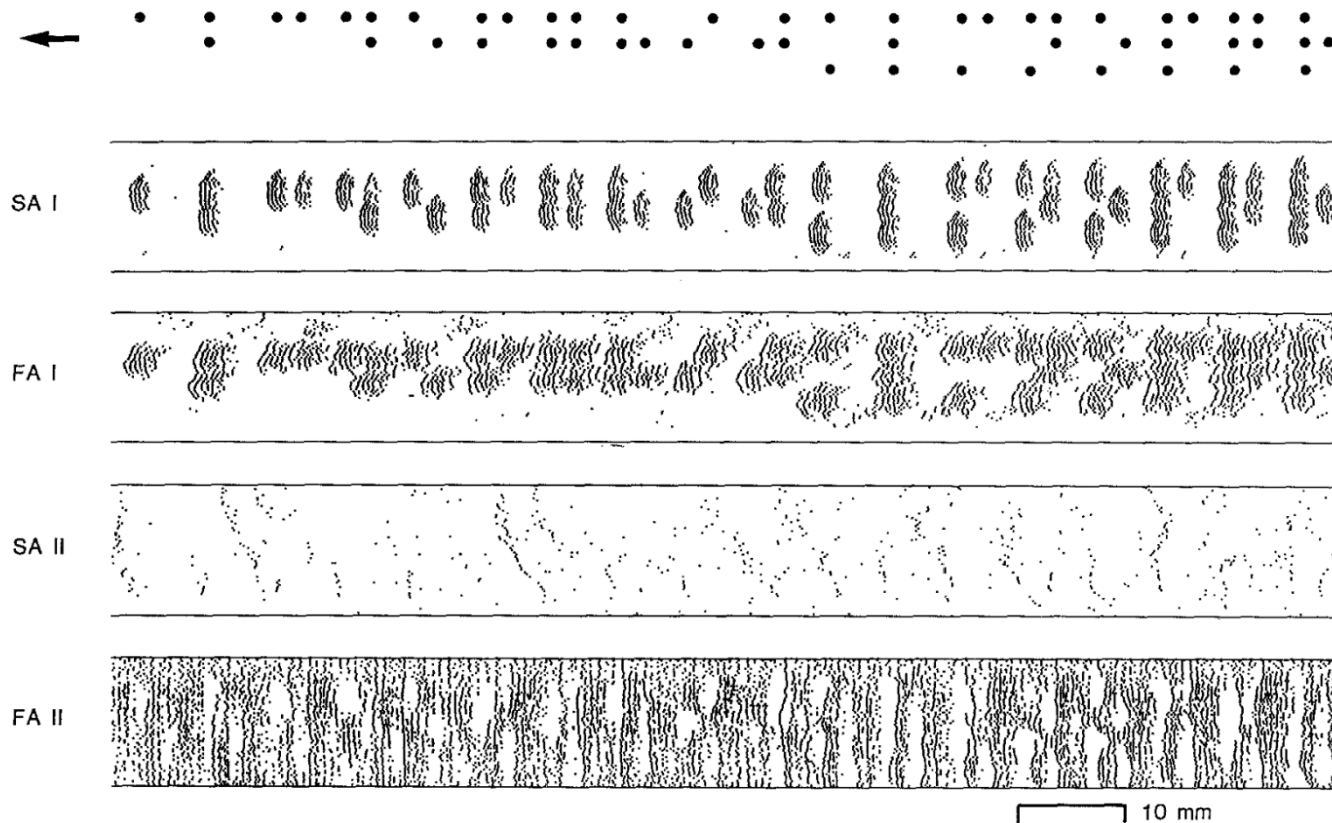


Au labo de microneuro



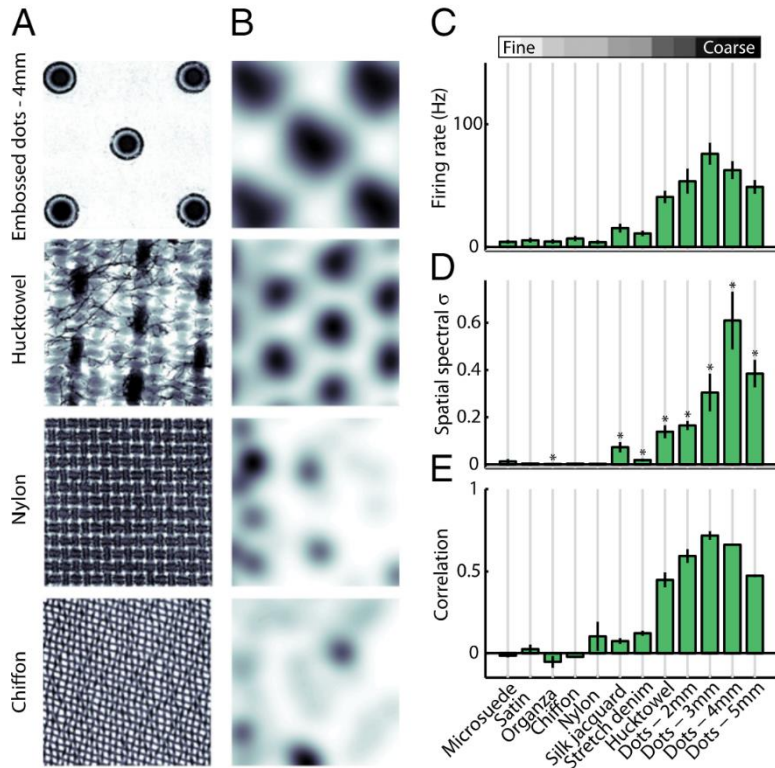
QQ études clefs: Toucher discriminatif

Aspects spatio-temporels

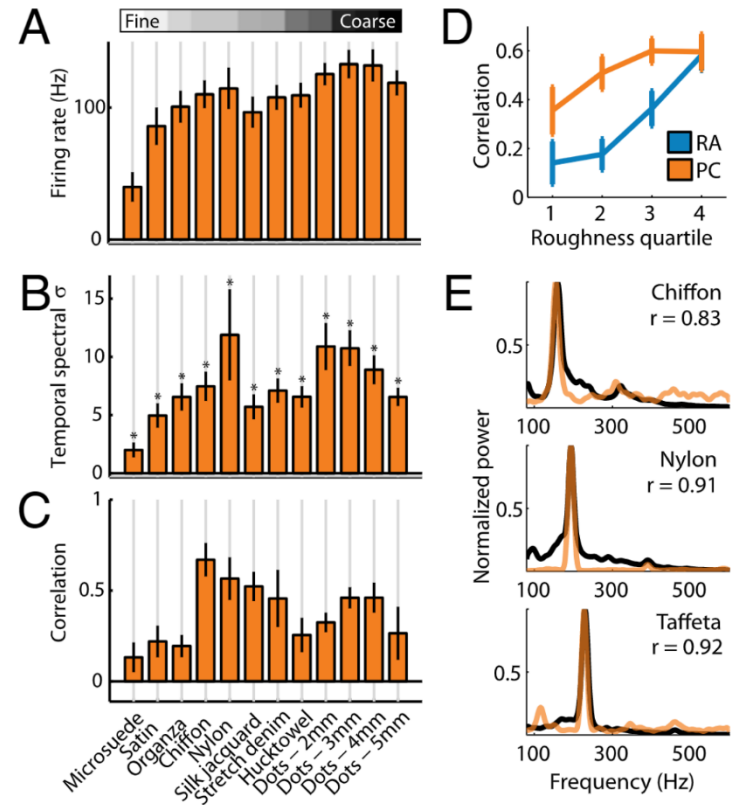


QQ études clefs : toucher discriminatif

Aspects spatio-temporels

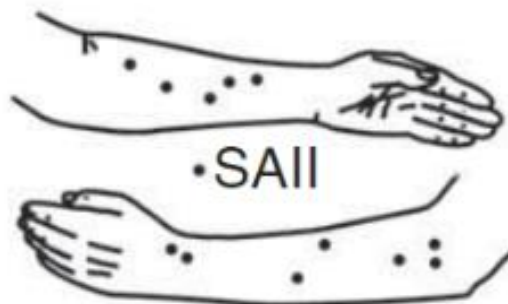
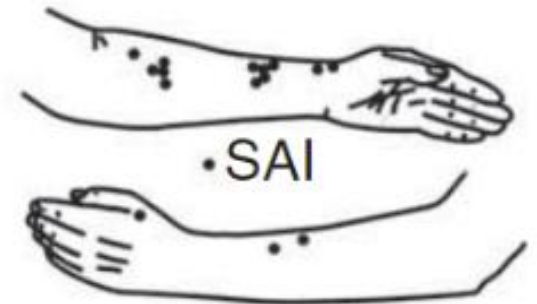
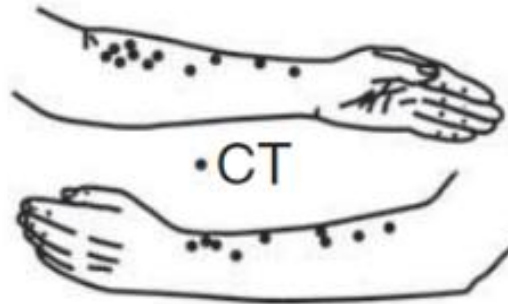
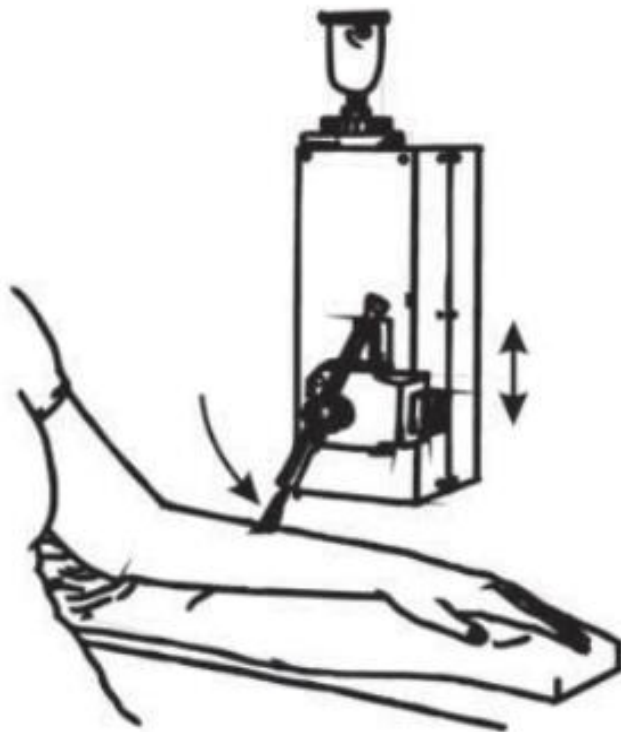


SA1 déchargent pour les textures embossées

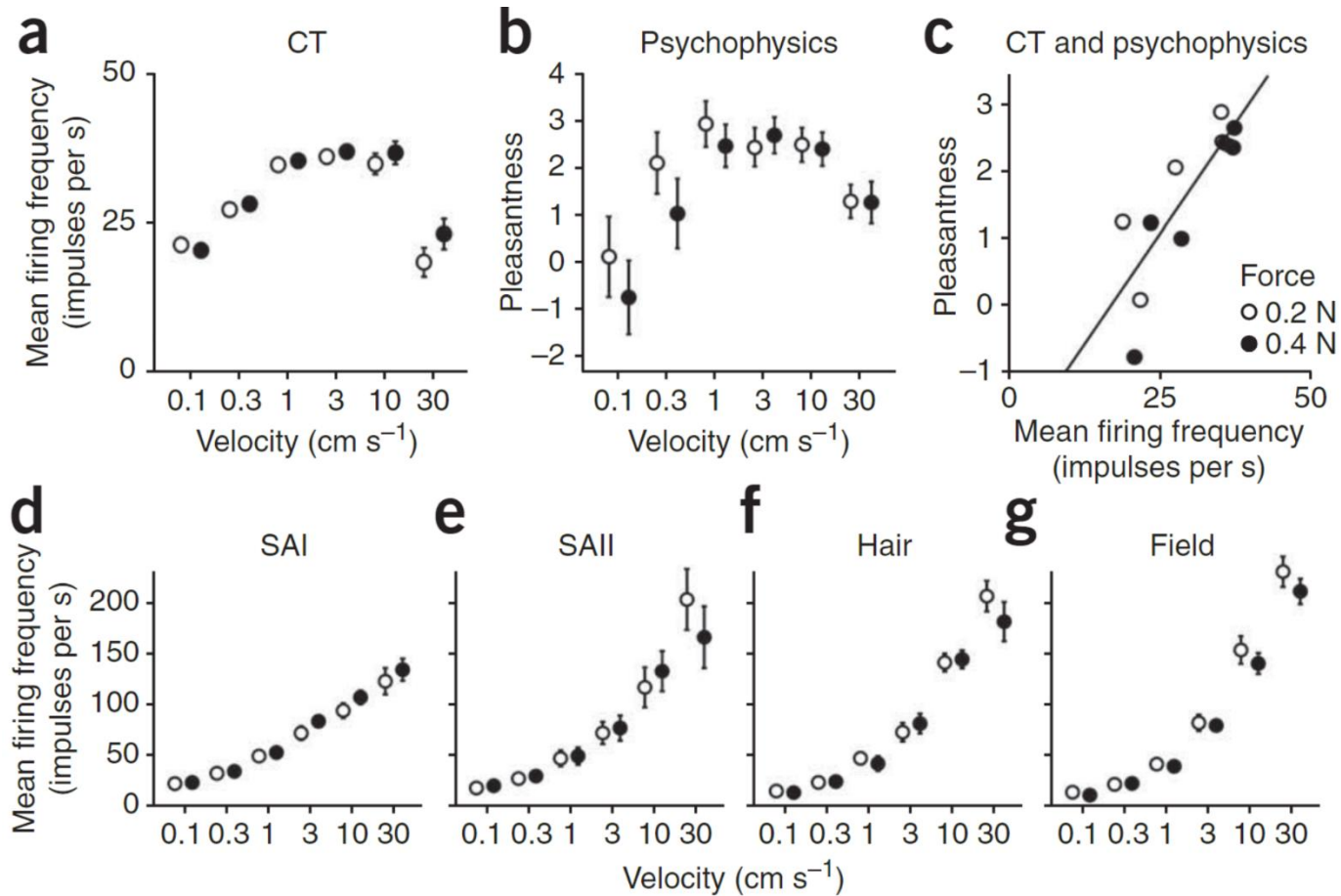


Les FAs déchargent pour les textures fines

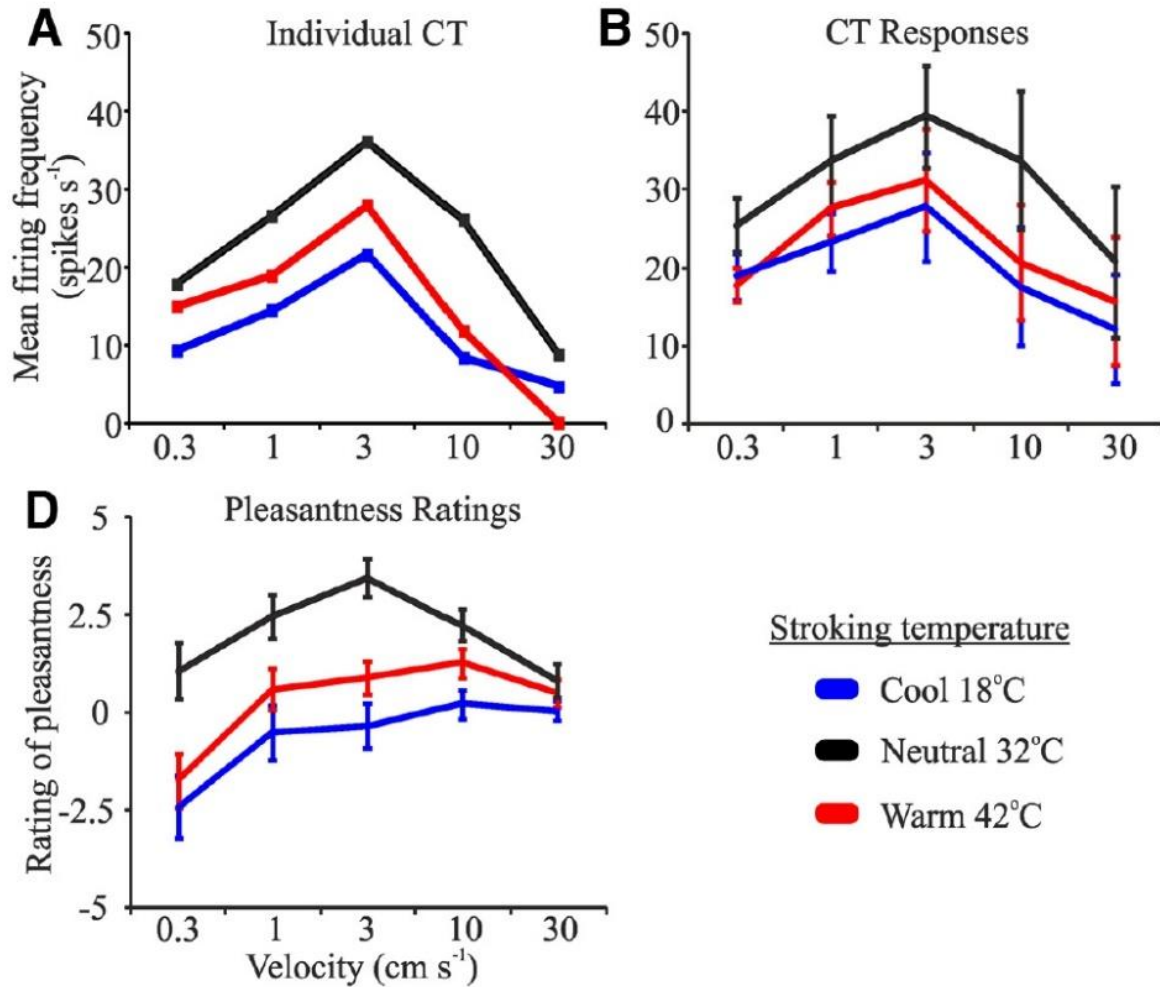
QQ études clefs: Toucher affectif



QQ études clefs: Toucher affectif

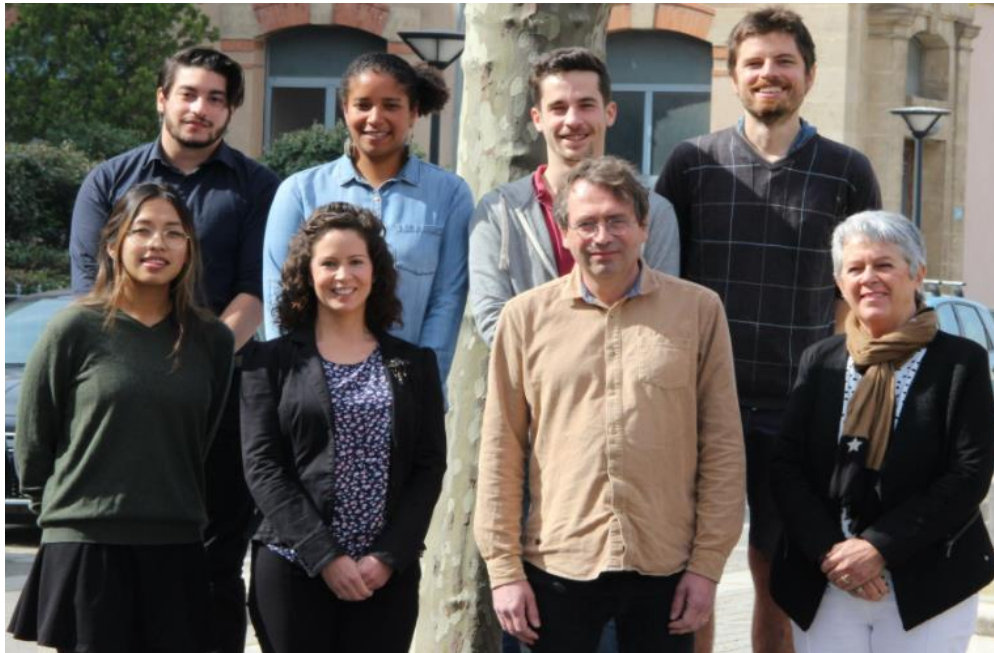


QQ études clefs: Toucher affectif



Bibliographie et Vulgarisation

- **Neurophysiologie: de la physiologie à l'exploration fonctionnelle** Vibert, Sebille, Lavallar-Rousseau, Boureau, Mazières 2^{ème} édition
- Reportages Arte:
 - *La proprioception, notre véritable sixième sens*
 - *Le pouvoir des caresses*



Equipe microneuro Marseille 2021



ERC Consolidator grant ARTTOUCH
To Rochelle ACKERLEY