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WHAT THE EYES DO NOT SEE

RATIONALE

- "WHAT THE EYES NOT SEE" MEANS THAT AT THE CLINIC WITHOUT THE PERTINENT KNOWLEDGE AND SPECIFIC TECHNOLOGY TO DETECT CERTAIN ANOMALIES & ASSESS UNUSUAL VISUAL SYMPTOMS WE WILL FAIL TO REACH A PROPER DIAGNOSIS

RATIONALE

- THE EYES ARE MUCH MORE THAN VISION, IMPLEMENTING MAJOR BIOLOGICAL FUNCTIONS.I.E., CIRCADIAN RYTHMS, SLEEP AND HORMONAL PERIODIC RELEASE ULTIMATELY SERVING OUR COGNITIVE AND AFFECTIVE BEHAVIOR BY WAY OF THE INTRINSICALLY PHOTONSENSITIVE RETINOGLIANGLIONIC PATHWAY (ipRGP)

TOPICS -1-

- PRIMARY VISUAL NON OCULAR FUNCTIONS OF THE EYES I.E., THE RETINOGLIANGIONIC PATHWAY AND ITS ROLE IN:
 - A. SUBCONSCIOUS PERCEPTIONS AND THE SHAPING OF CONSCIOUS PERCEPTIONS
 - B. ROLE IN SLEEP AND MEMORY
 - C. ROLE IN CIRCADIAN RHYTHMS AND HORMONAL RELEASE

TOPICS-2-

- CONDITIONS OFTEN DIFFICULT TO ASSES BECAUSE THEY ARE INTERMITTENT, CYCLICAL OR NOCTURNAL MAKING DIAGNOSIS MORE CHALLENGING SINCE THE PATIENT MAY HAVE NO SYMPTOMS WHEN SEEN AT THE CLINIC
- ARE THE PATIENT TRANSIENT SYMPTOMS PERHAPS EPILEPTIC, MIGRANOUS OR PSYCHOGENIC IN NATURE ?

TOPICS(3)

- GI BACTERIA AND THE EYES:THE GUT MANIPULATES THE EYES
- COGNITIVE VISUAL CONDITIONS, I.E., PROSAPOGNOSIA, PALINOPSIA, EPILEPSY WITH PARTIAL SIMPLE AND PARTIAL COMPLEX SEIZURES
- THE EYES IN NEURODEGENERATIVE DISEASES I.E., FRONTOTEMPORAL DEMENTIA, ALZHEIMER'S AND PARKINSON'S

THE INPONDERABLE

UNCONSCIOUS HELPS TO CREATE REALITY

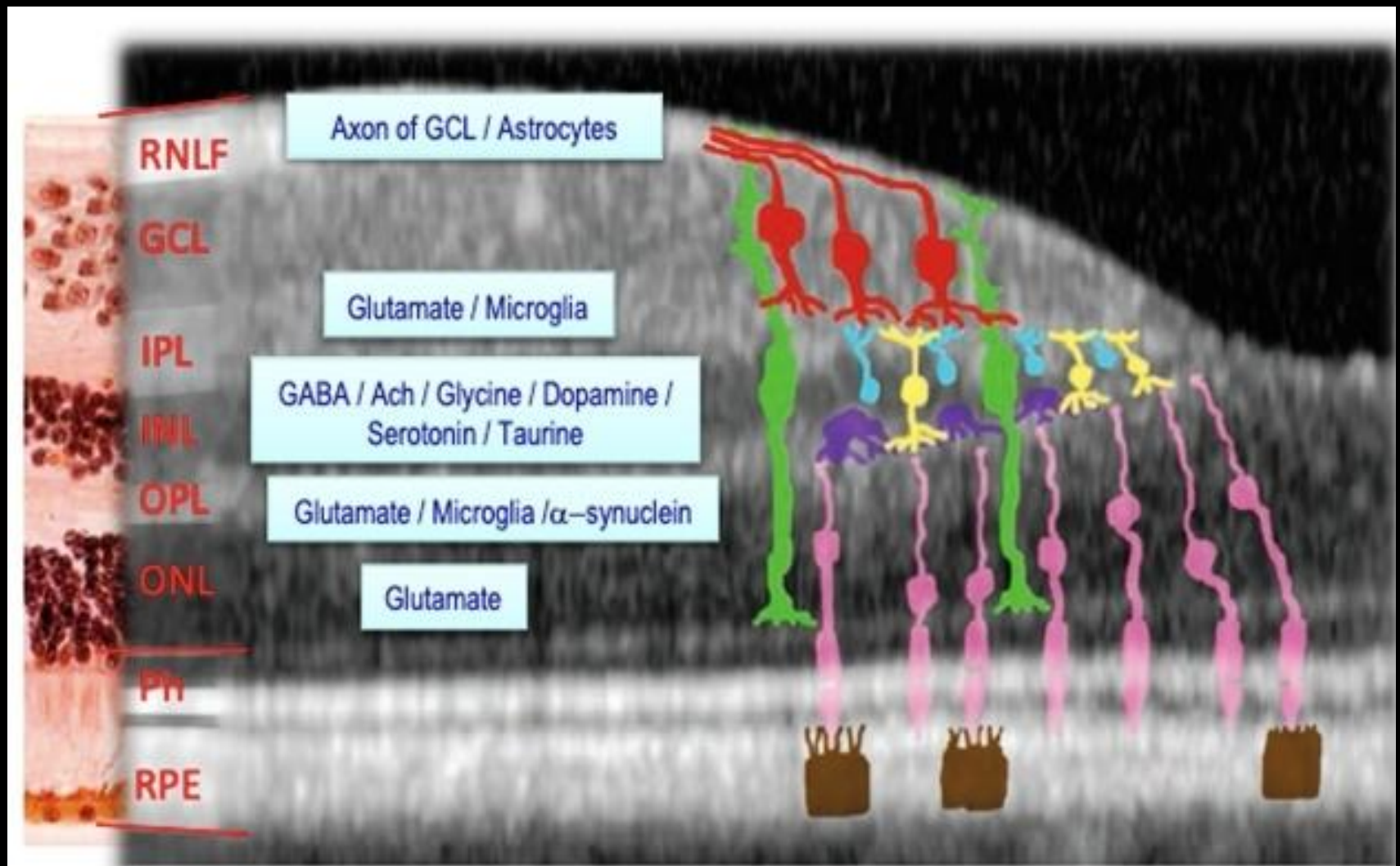
90% OF THE SELF THAT IS MEDIATED BY
PARALLEL OR "PERIPHERAL" INFORMATION
ELICITED BY A CURRENT CONSCIOUS VISUAL
EXPERIENCE IS RECONCILED WITH PREVIOUS
CONSCIOUS AND UNCONSCIOUS MEMORIES
RECREATING A NEW CURRENT REALITY

- THE UNCONSCIOUS ASSIGNS AFFECTIVE VALUE
OF PRESENT CONSCIOUS PERCEPTIONS WITH
LOVING, HAPPY, SAD, HATING,
FEARFUL, HOPEFUL, PESSIMISTIC, OPTIMISTIC, UN
REAL AND IMAGINARY FEELINGS

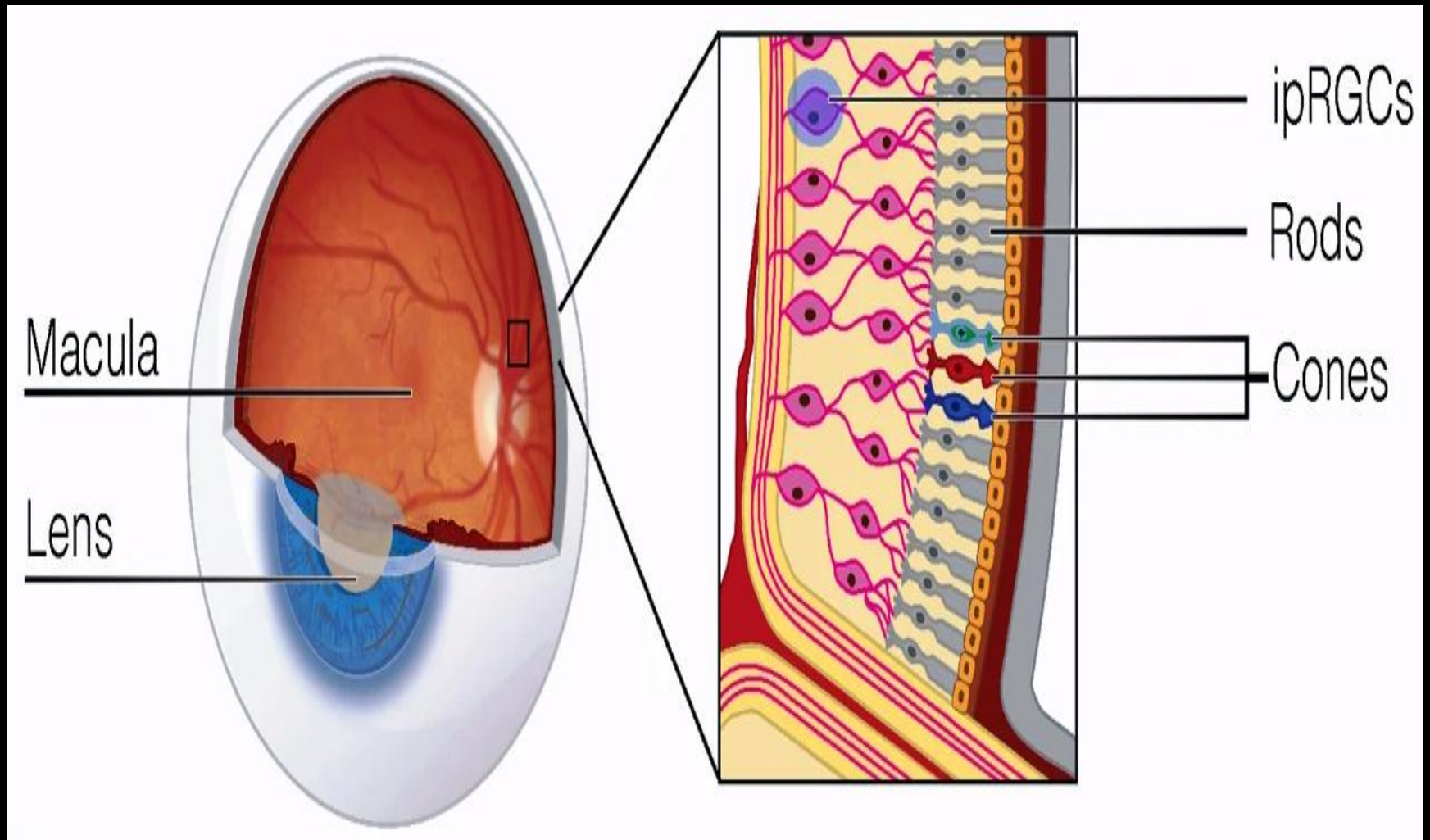
Is it justified to send patients with complex symptoms to the eye Dr?

- **ALWAYS JUSTIFIED** EVEN IF SYMPTOMS ARE ATYPICAL, COMPLEX OR ONLY PERIODIC BECAUSE THE EYE AND THE BRAIN CONSTITUTE **A TWO WAY STREET**
- THE EYE IS AN EXTENSION OF THE CNS LIKE THE SPINAL CORD AND THE PERIPHERAL NERVES
- INFORMATION ELABORATED IN THE CNS IS PROJECTED BACK TO THE PERIPHERAL NERVOUS SYSTEM FOR CONSCIOUS & **UNCONSCIOUS REPROCESSING**, MORE IN THE CASE OF SPECIAL SENSES LIKE VISION

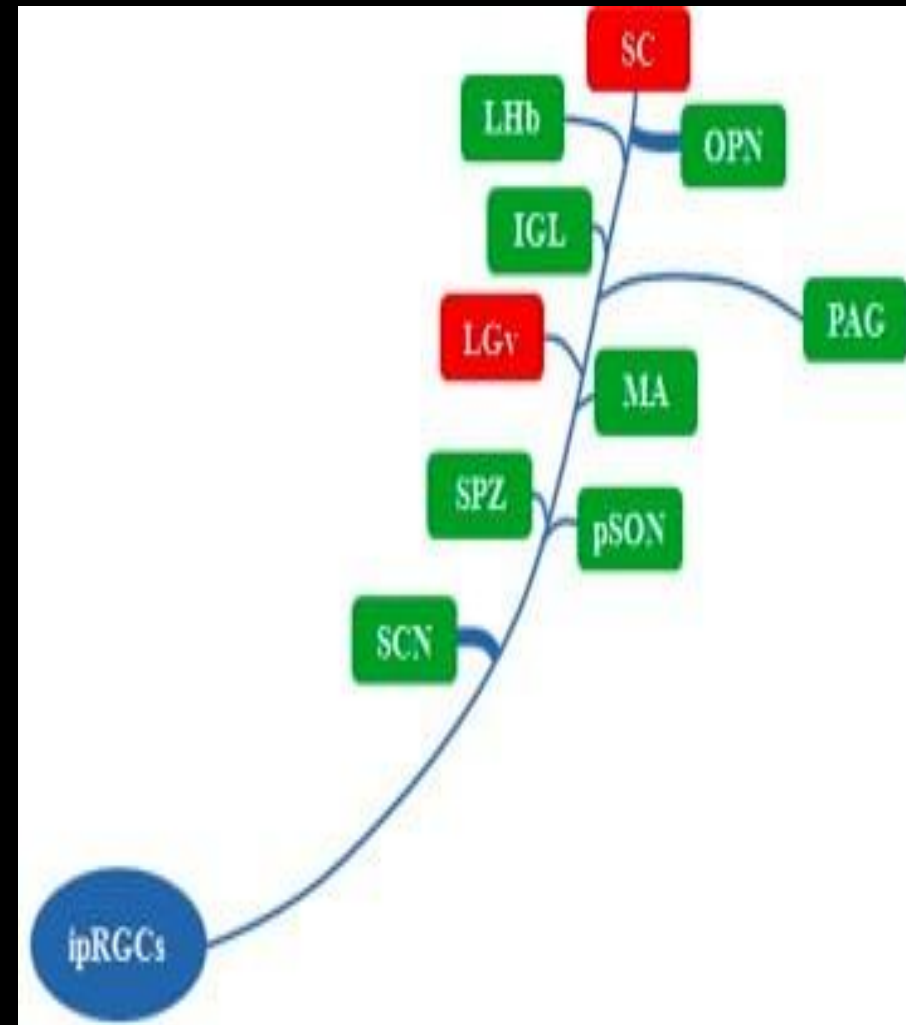
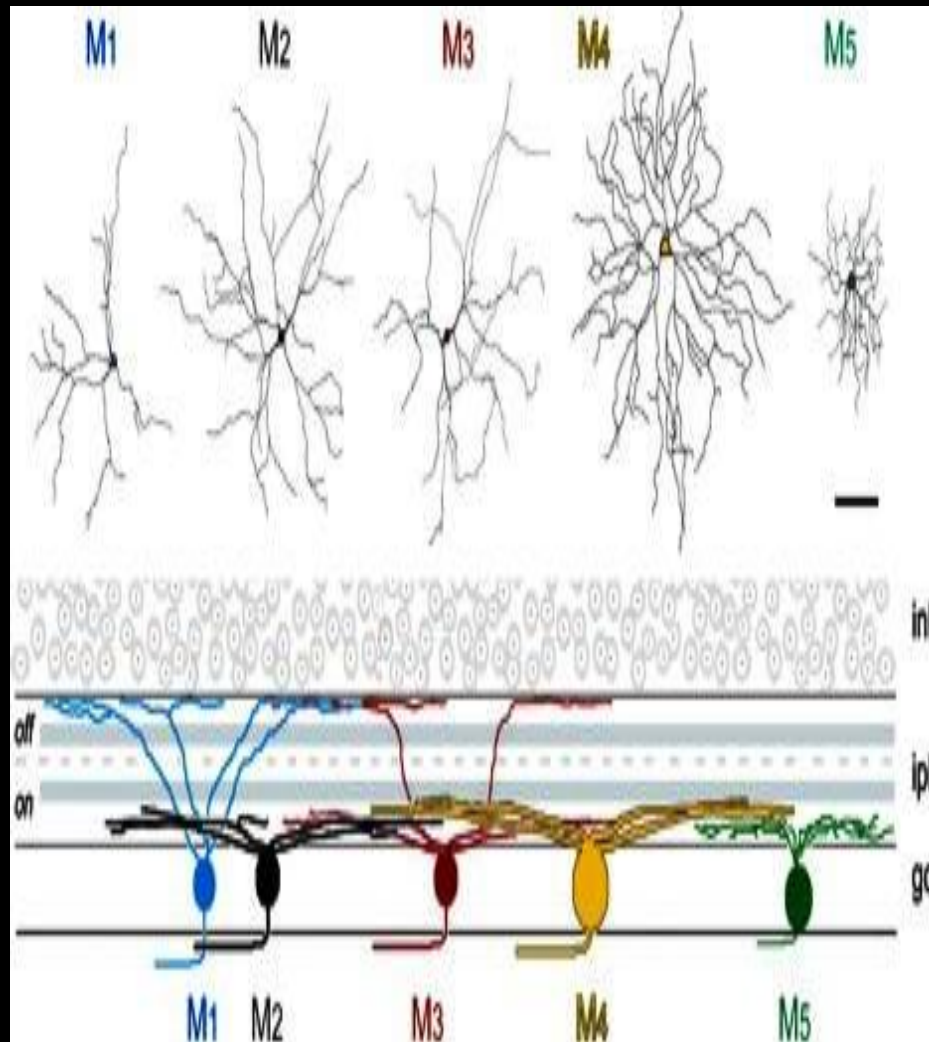
COMPLEX MEANS COMPLEX!



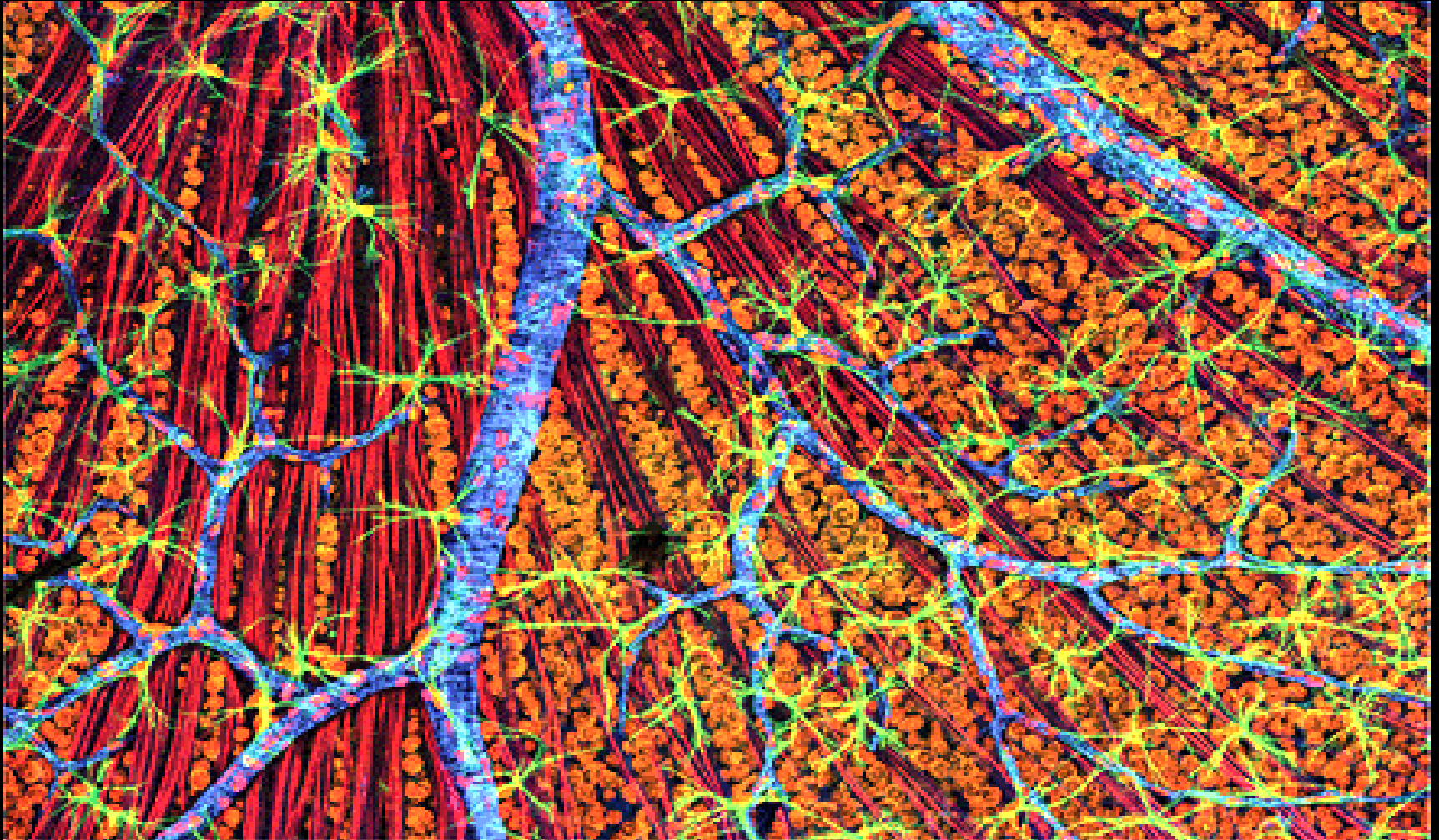
Intrinsically photosensitive RETINOGLIANGLIONIC PATHWAY



Ip RETINOGLIANGLIONIC CELLS



RETINAL GANGLION CELLS ORANGE- OPTIC NERVE FIBERS RED



ipRG PATHWAY AND THE UNCONSCIOUS

- Ip RGP UNCONSCIOUS REGISTRATION OF PARALLEL INFORMATION RELATED TO SIMULTANEOUS CONSCIOUS PERCEPTIONS MODULATES, RESHAPES AND CONDITIONS FINAL CONSCIOUS AWARENESS
- THIS REPRESENTS THE FREUDIAN “REPRESSED” UNCONSCIOUS INFLUENCE ON CONSCIOUS BEHAVIOR

CATAMENIAL PSYCHOSIS, “MITTELSCHMERZ” & MENOPAUSE

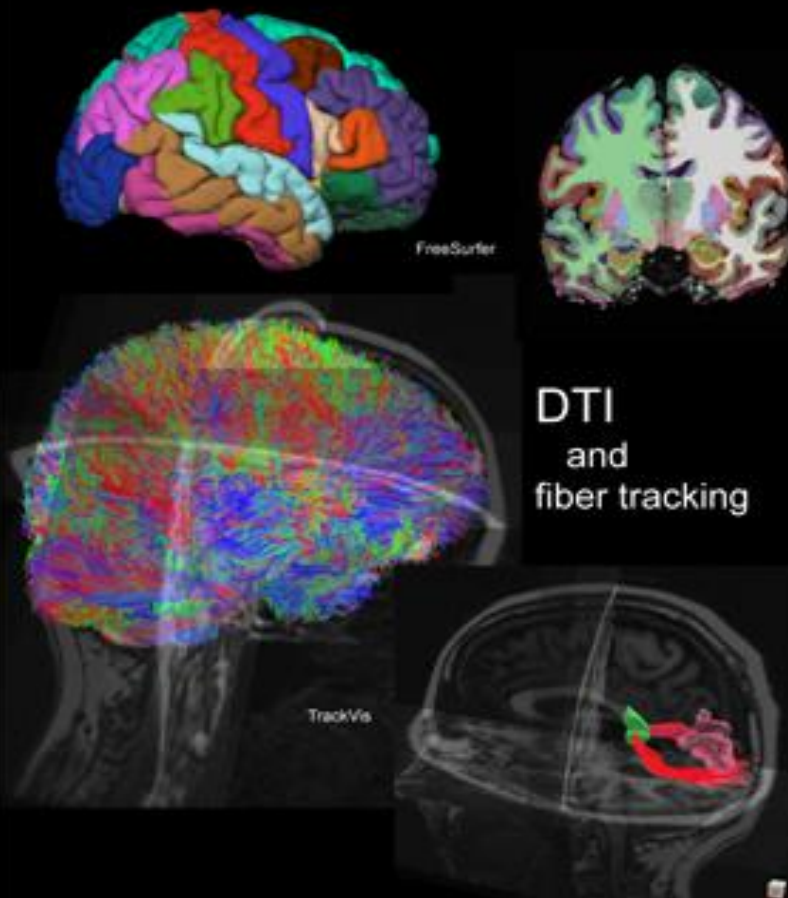
- THE ip RETINOGLIANGIONIC PATHWAY IS ALSO BIDIRECTIONAL (“TWO WAY STREET”) WE SEE NOT ONLY WHAT WE CAN SEE BUT ALSO WHAT WE WANT TO SEE TO CONFIRM OUR UNCONSCIOUS BELIEFS
- HORMONAL CHANGES DURING MENSES, MIDDLE OF THE CYCLE & MENOPAUSE ACCOUNT FOR CYCLICAL (“CATAMENIAL”) PSYCHOSIS AND DEPRESSION & FOR MITTELSCHMERZ

UNCONSCIOUS ANXIETY (PTSD) IN PREGNANT WOMEN AFFECTS THE UNBORN BABY

- PRENATAL MOTHER ANXIETY (PTSD) RESULTS IN DELAYS ON INFANT DEVELOPMENT, < ACADEMIC ACHIEVEMENT, > EMOTIONAL REACTIVITY, & EMOTIONAL BEHAVIORAL PROBLEMS TROUGH ADOLESCENCE
- CHANGES INCLUDE VOLUME REDUCTION OF PREFRONTAL, PREMOTOR, TEMPORAL AND CEREBELLAR CORTEX

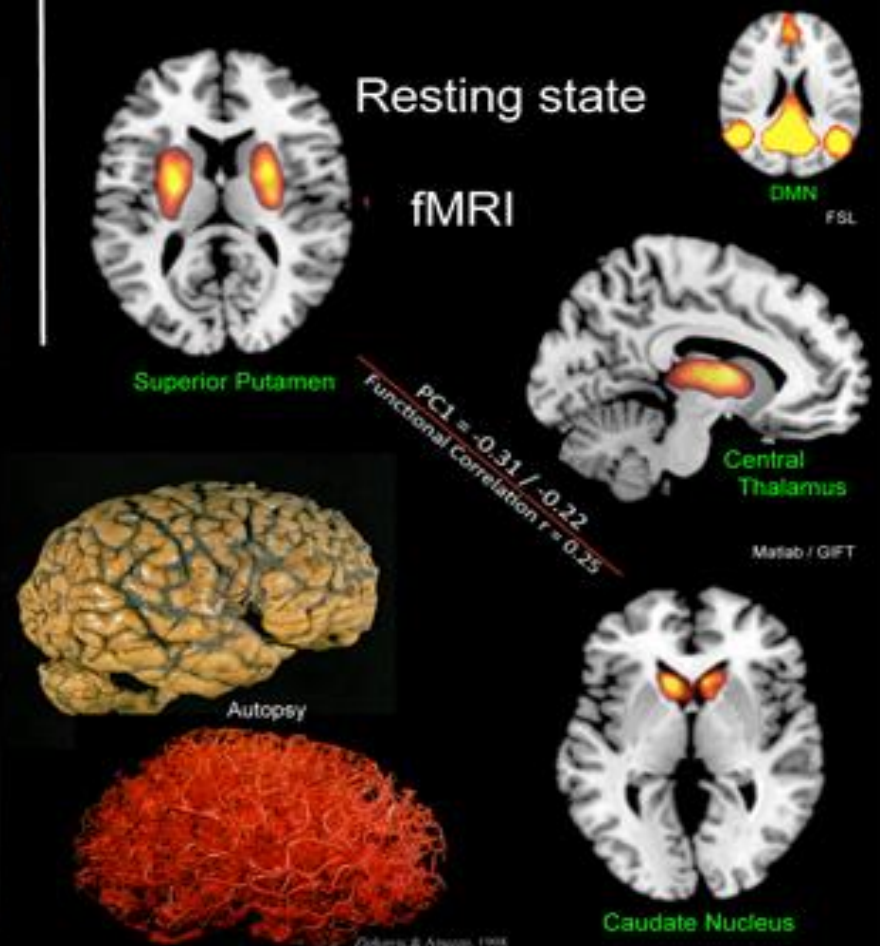
CONNECTIVITY STUDIED WITH fMRI

Structural connectivity



Haasz, Hodneland, Ystad, Westbye, Eichele, Lundervold, Ulf

Functional connectivity



Resting state

fMRI

Superior Putamen

FSL

Central
Thalamus

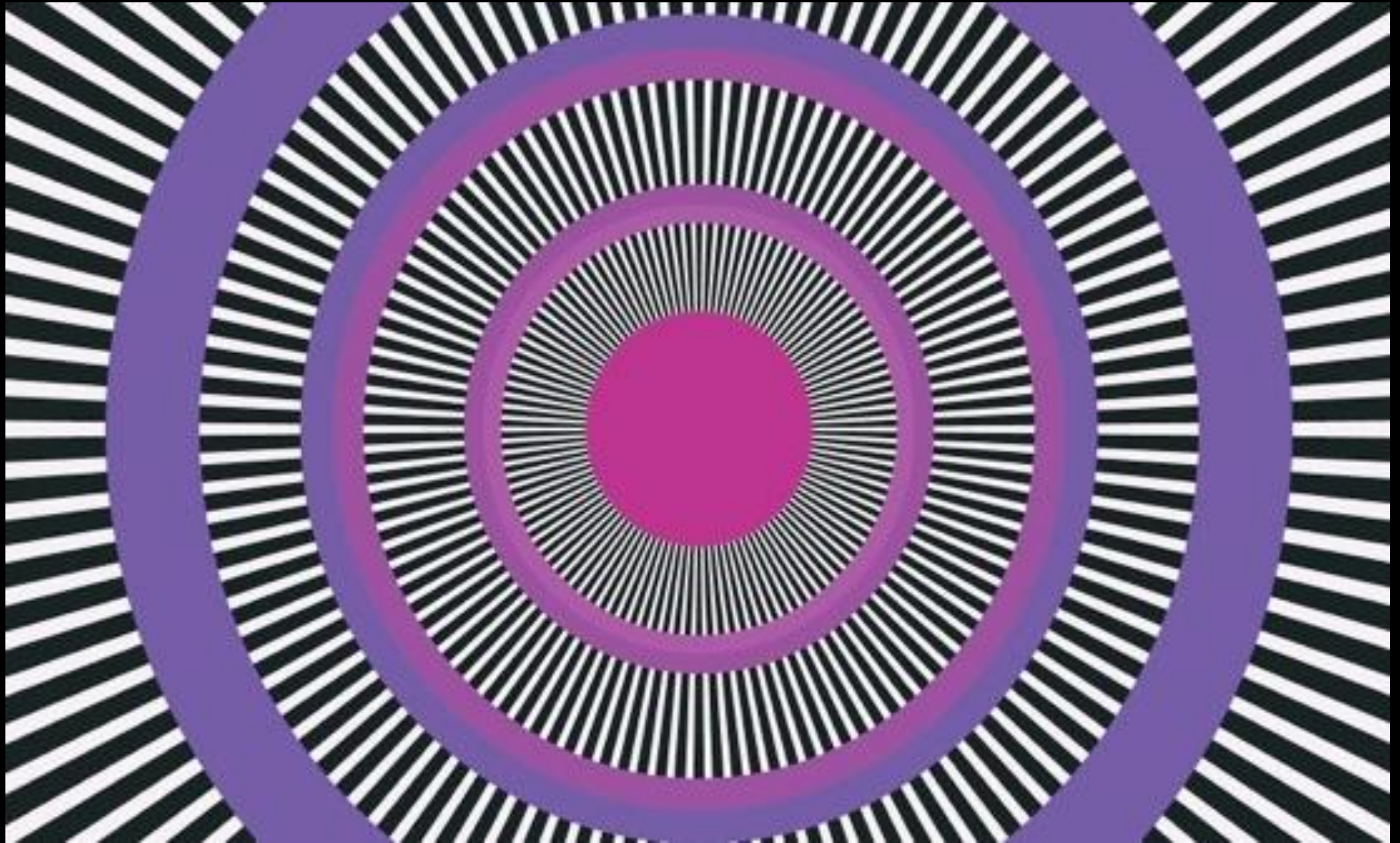
Matlab / GIFT

Autopsy

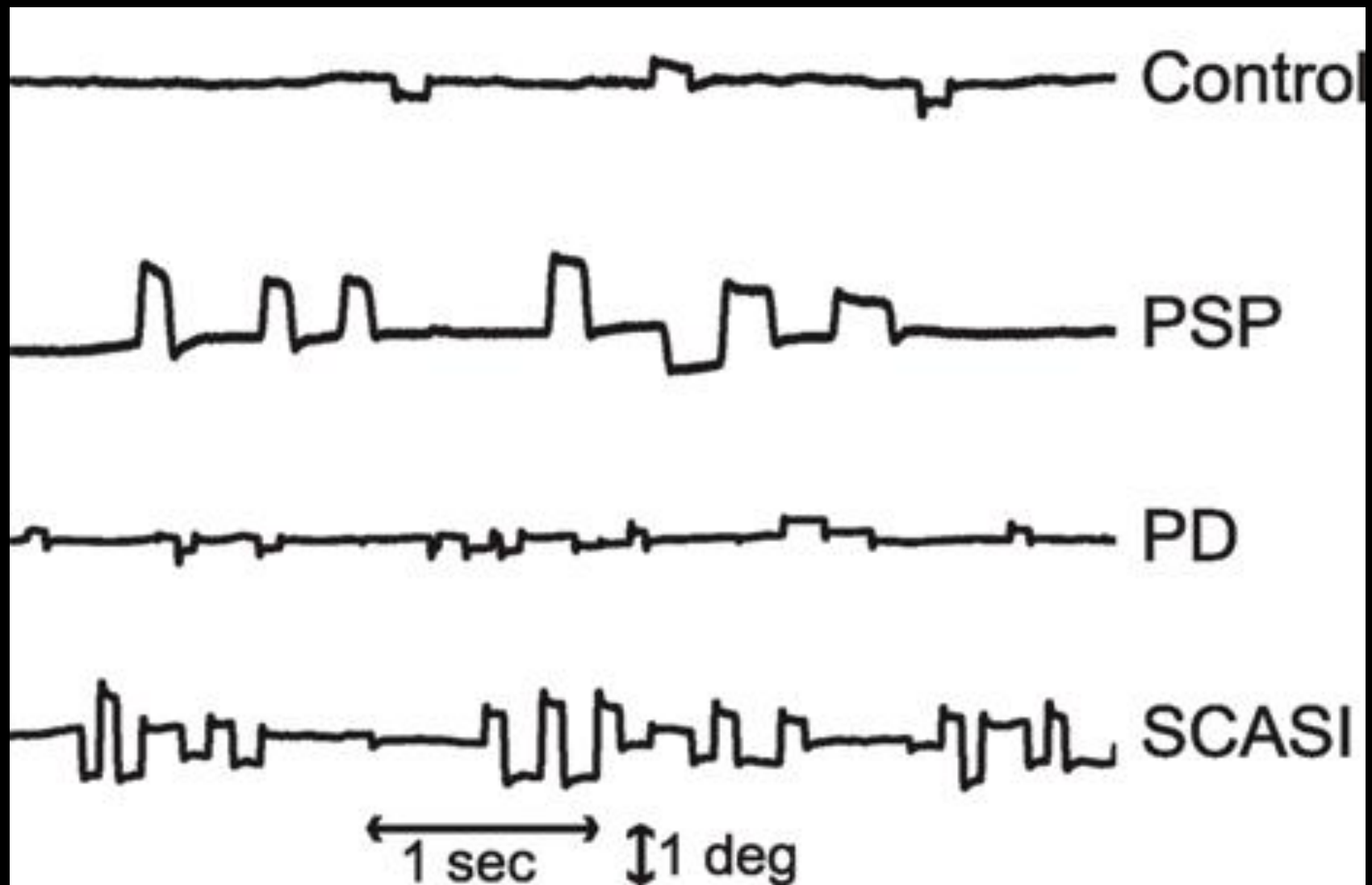
Caudate Nucleus

Lidman & Anderson, 1988

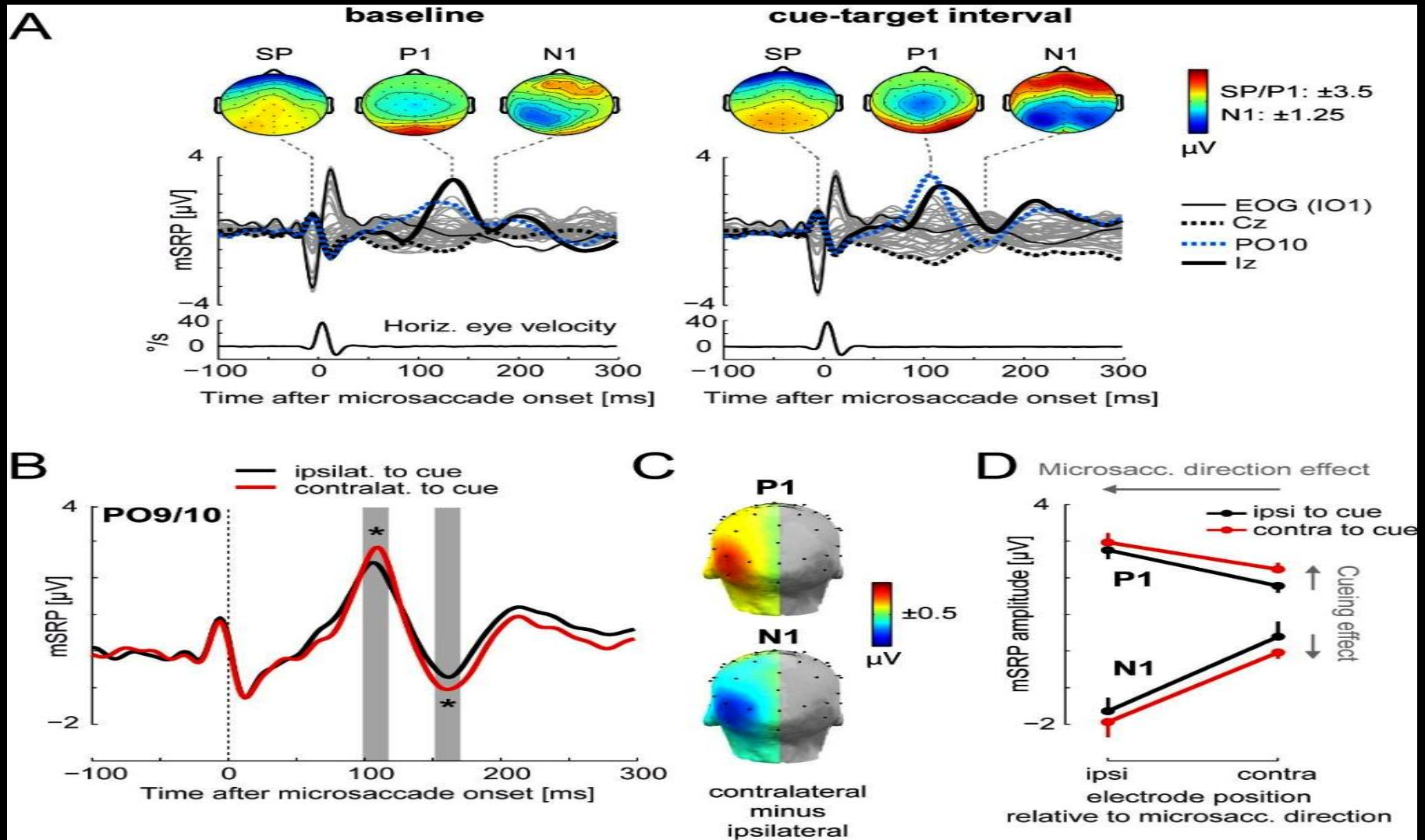
ENIGMA ILLUSION & NOT ALL WE SEE IS TRUE (WELL..YES AND NO!)



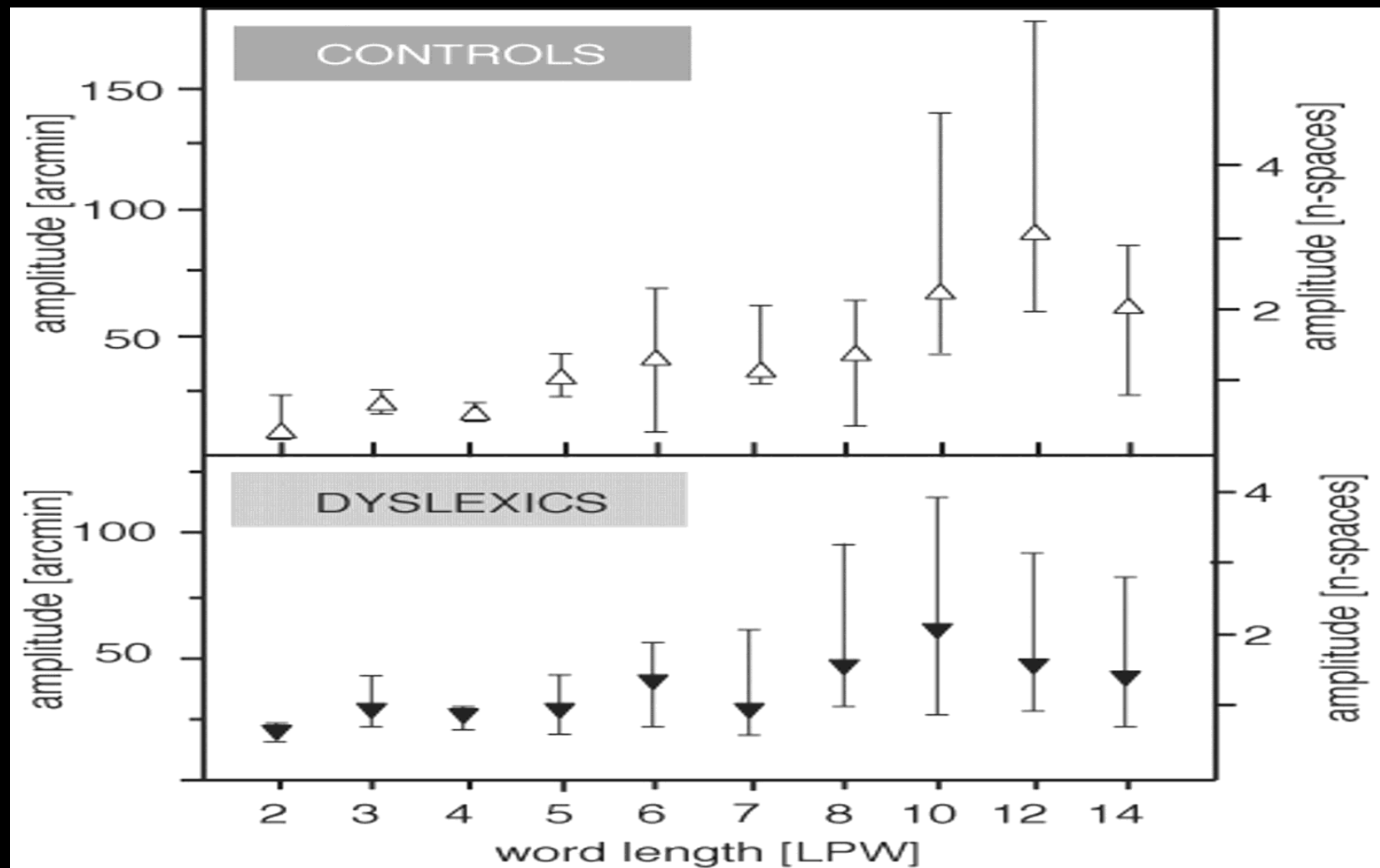
OCULAR MICROSACCADES & ITS SIGNIFICANCE IN COGNITION



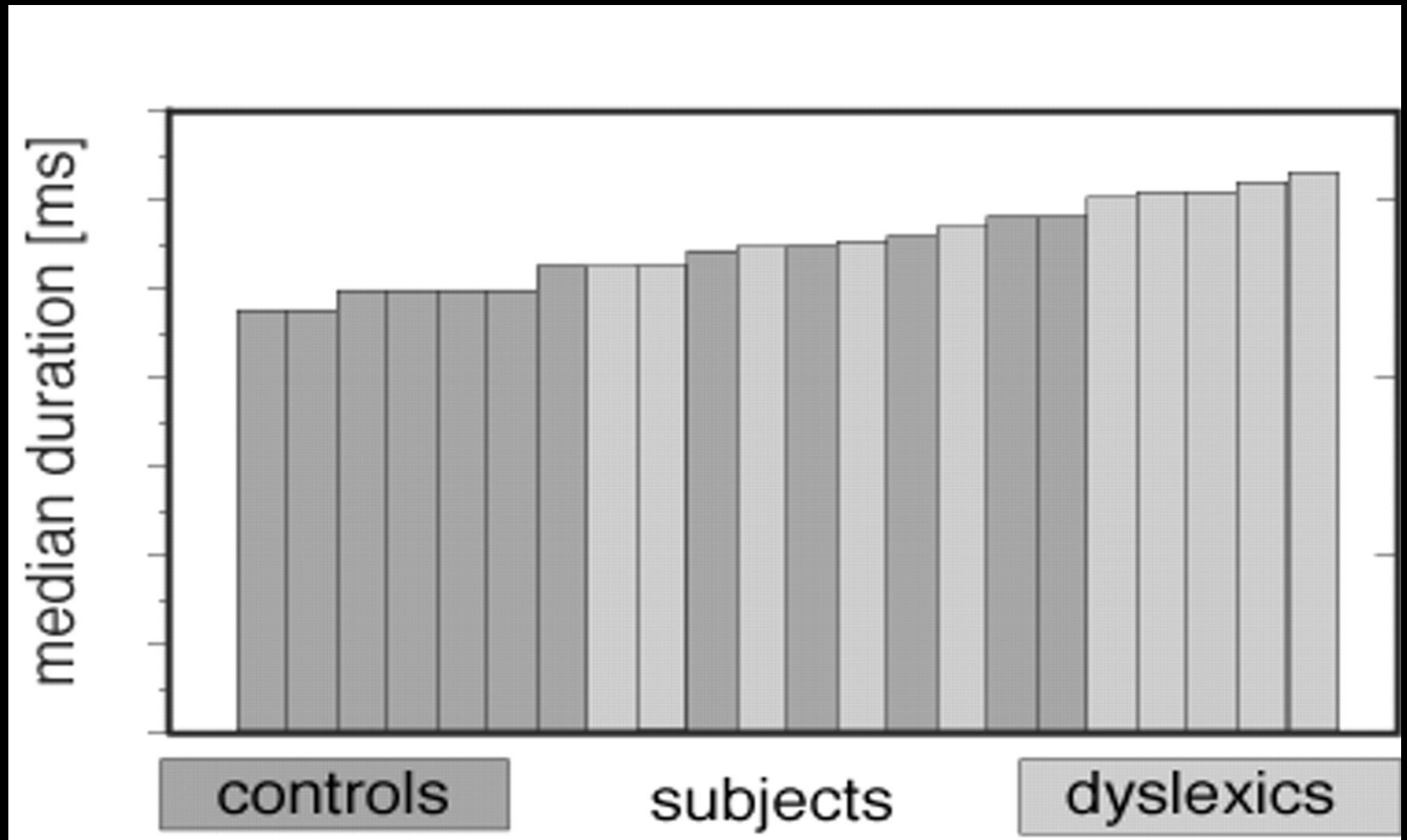
MICROSACCADES RELATED POTENTIALS (MEYBERG S., 2014)



DYSLEXIA A MICROSACCADES MOVEMENT DISORDER?



DYSLEXIA INTER-SACCADE INTERVALS



**IN DYSLEXIA IS NOT ALL BAD
NEWS!: CAN YOU SEE THIS**



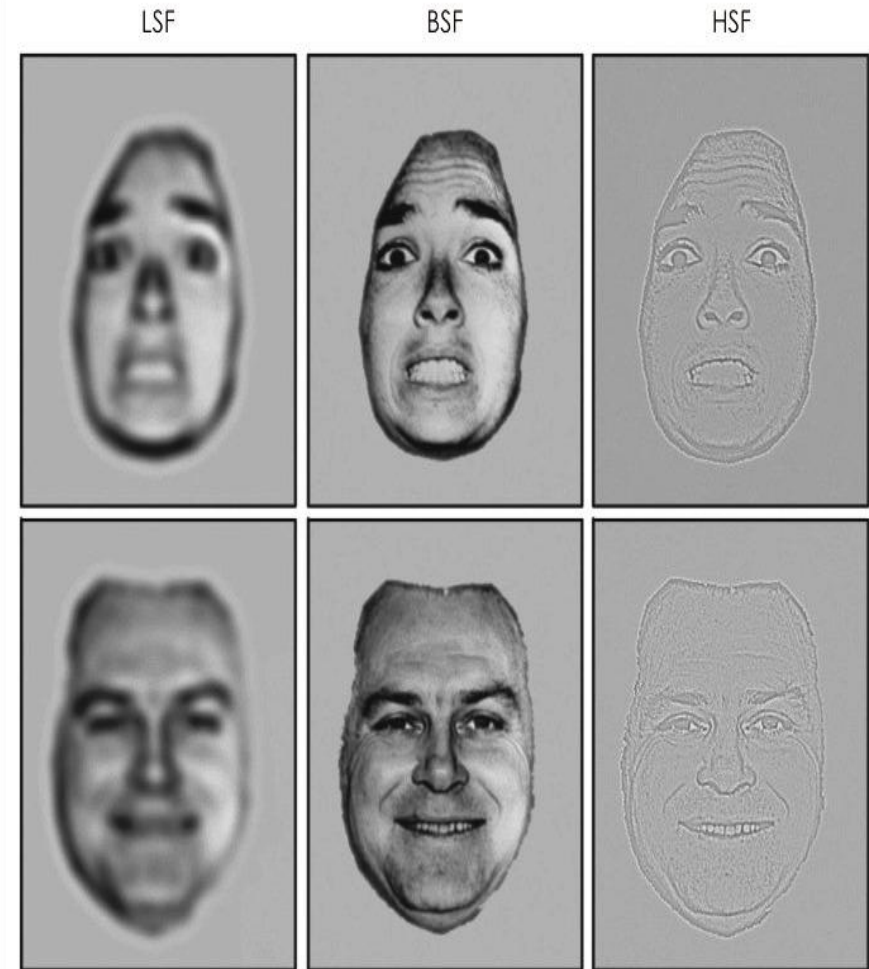
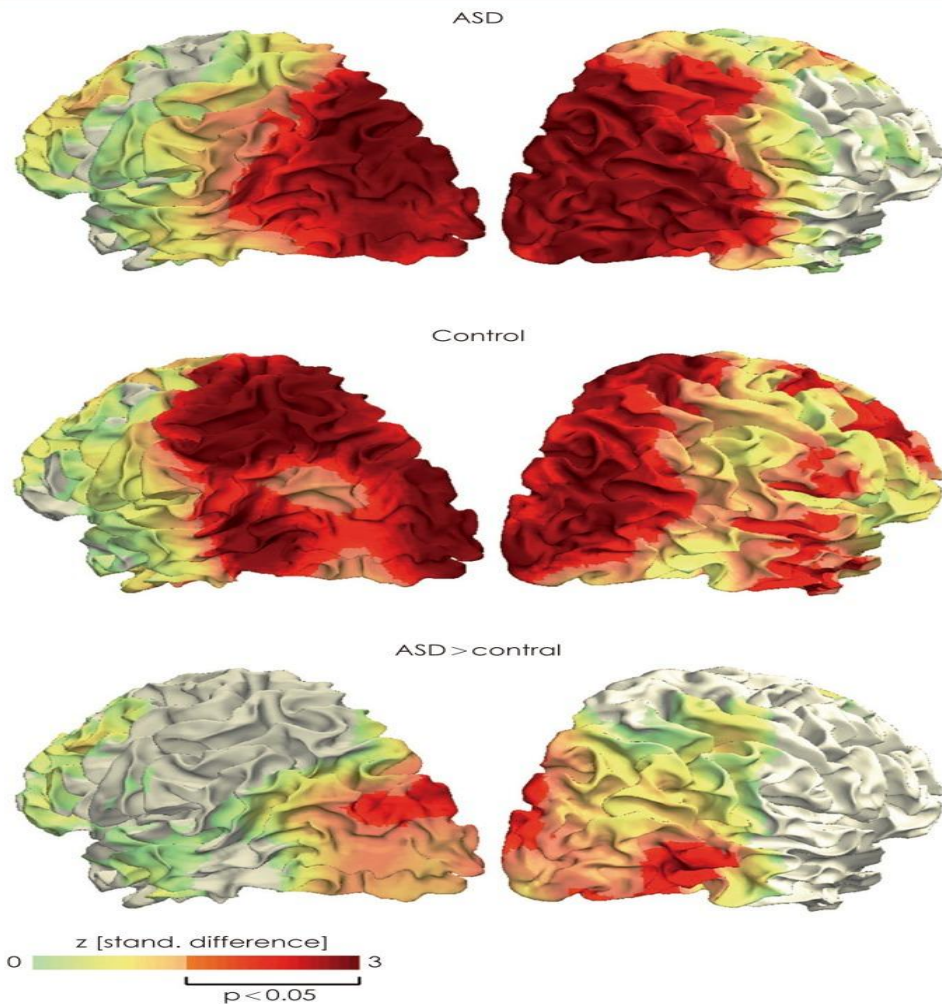
THE NINE BLESSINGS IN DYSLEXIA

- 1. SEE A BIGGER PICTURE: WIDER LENSES
- 2. FINDS THE ODD ONE OUT: THINGS OUT OF PLACE
- 3. BETTER PATTERN RECOGNITION
- 4. GOOD SPATIAL KNOWLEDGE
- 5. PICTURE THINKERS

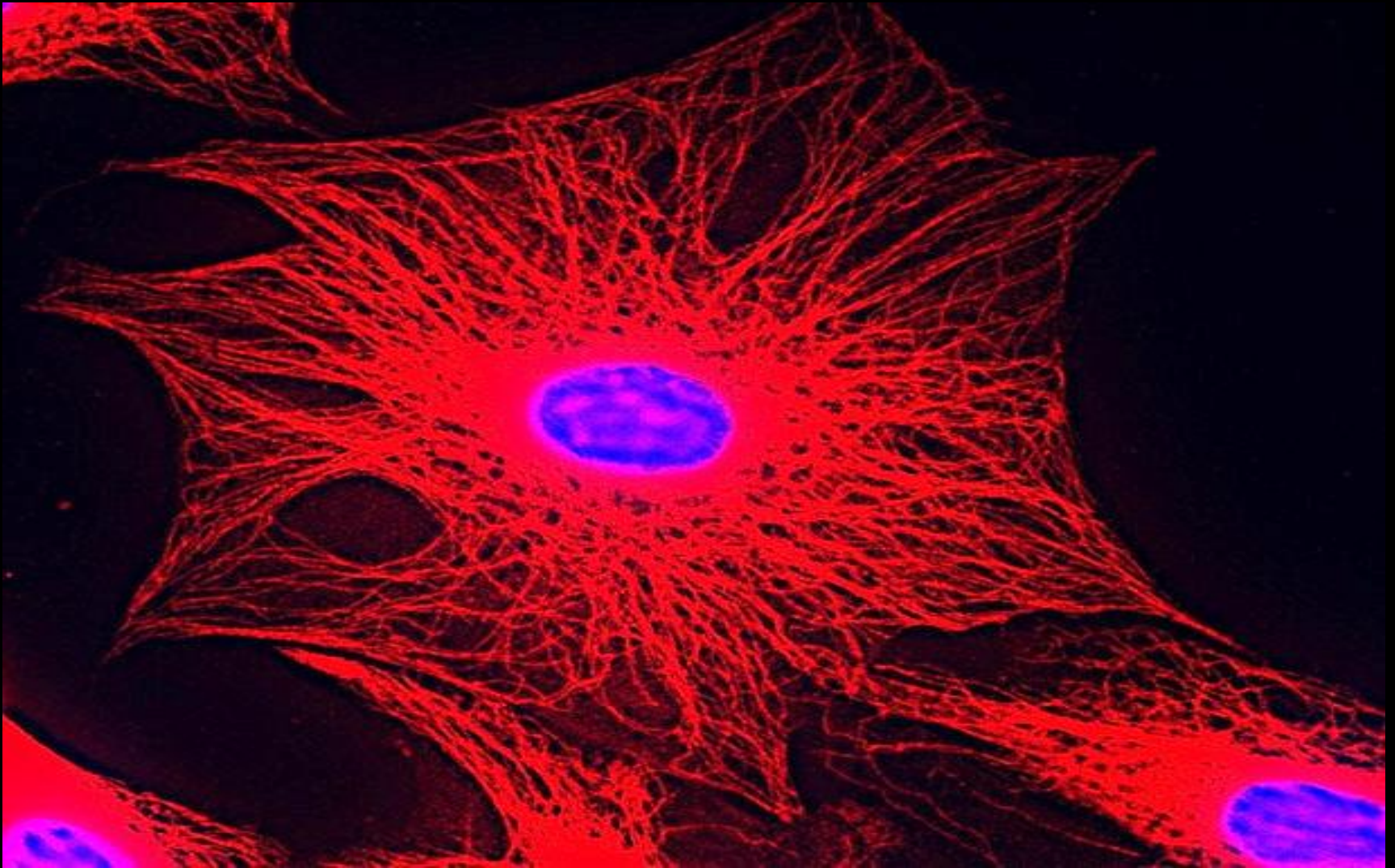
THE NINE BLESSINGS IN DYSLEXIA

- 6. SHARPER PERIPHERAL VISION
- 7. BUSINESS ENTERPRENEURS
- 8. HIGHLY CREATIVE
- 9. THINK OUTSIDE THE BOX
(INVENTORS)

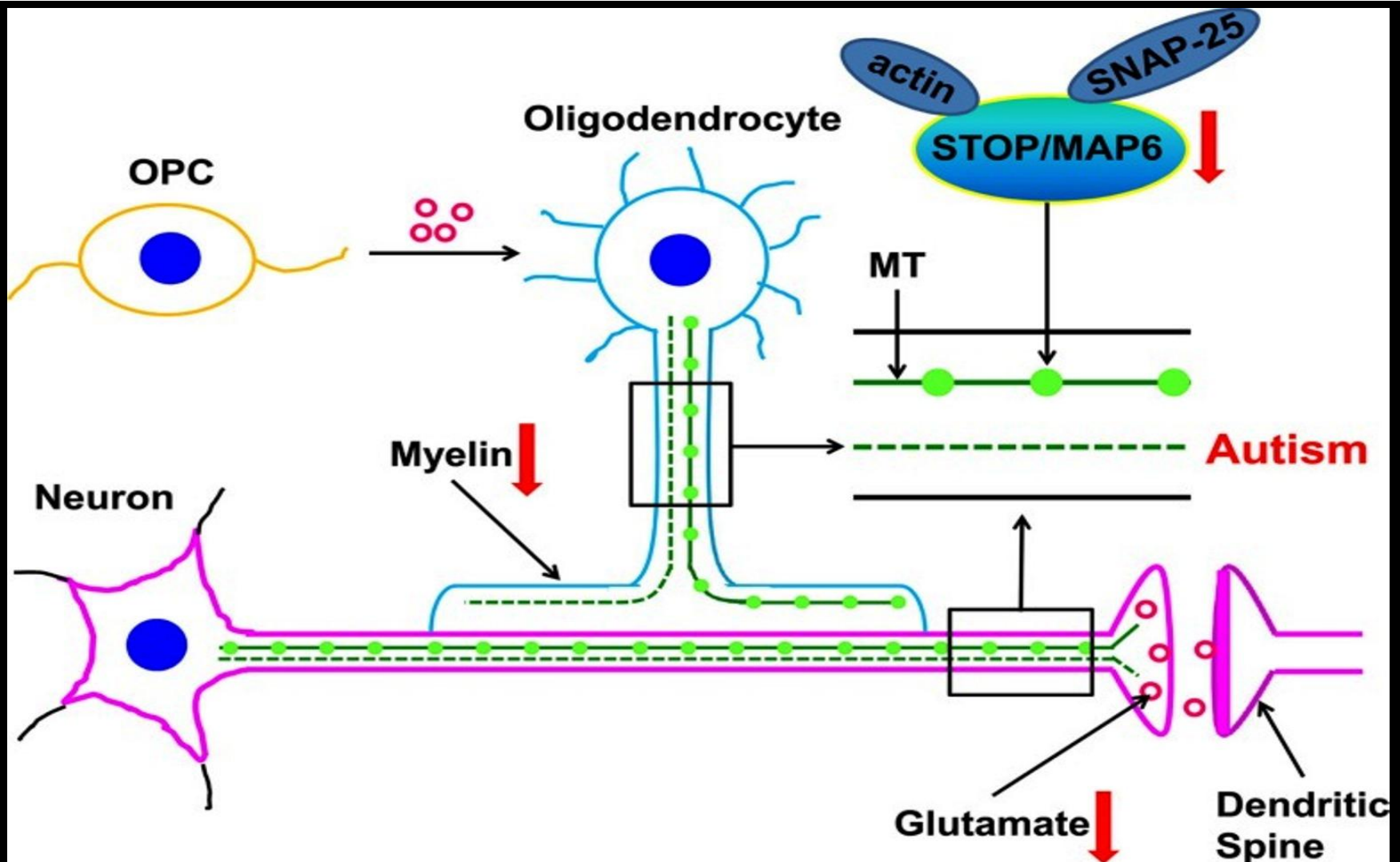
VISUAL SYSTEM IN AUTISM



QUANTUM DOTS IN MICROTUBULES



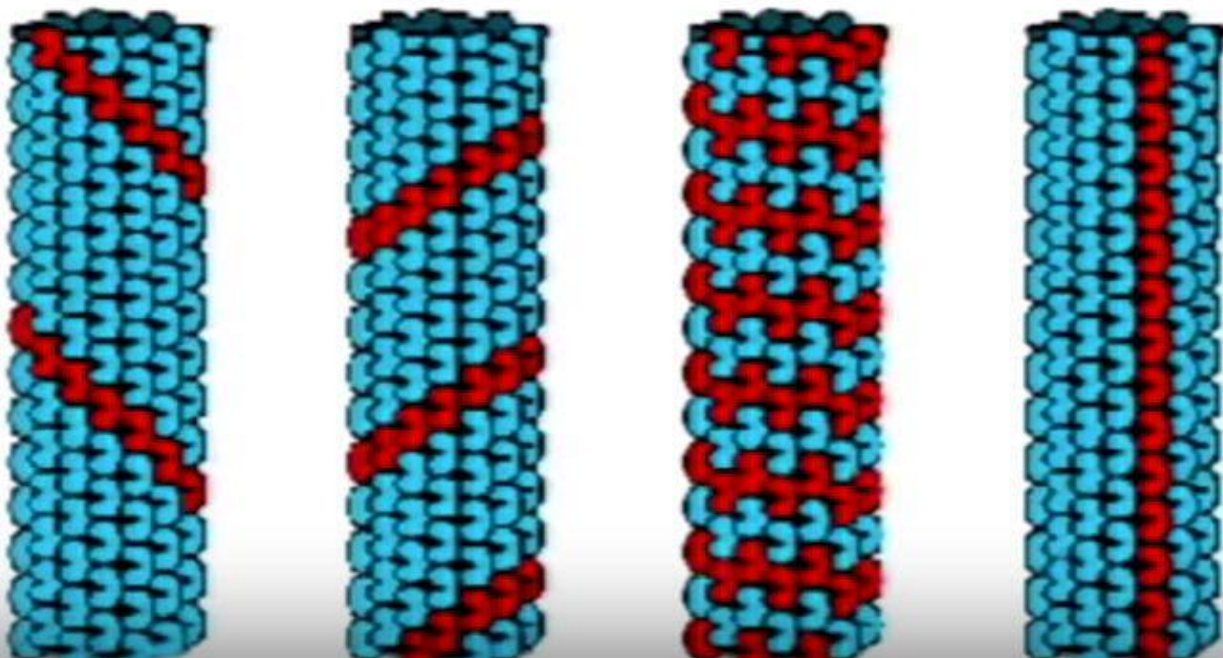
CELL MICROTUBULES IN ASD



FLICKER FUSION FREQUENCY AND DIFFERENT SPECIES REALITY PERCEPTS!!!!

Topological qubits

Qubit can be particular pathway rather than states of specific units within the pathway. Penrose suggested topological qubits in microtubules based on Fibonacci geometry



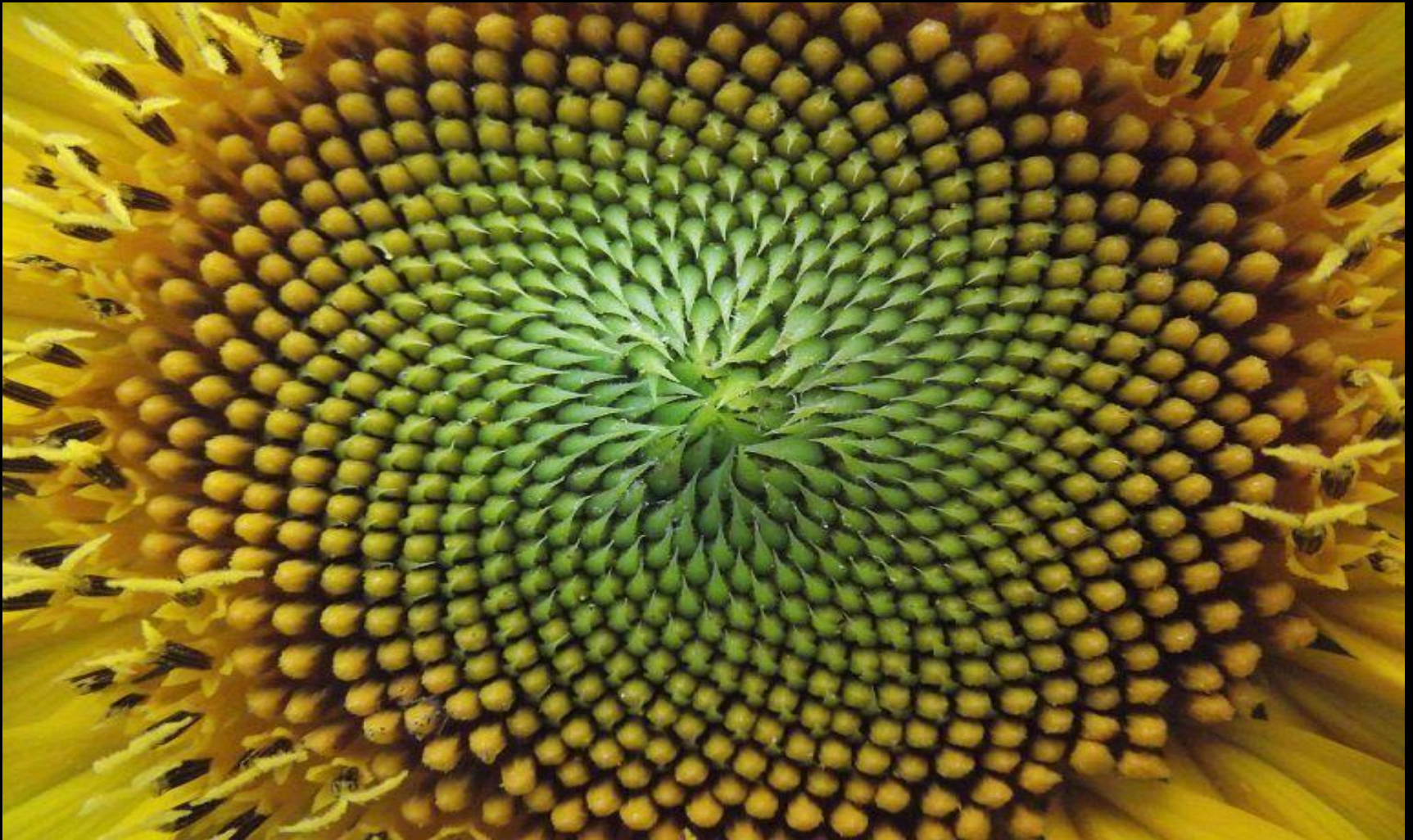
QUBITS IN GIFTED SAVANTS: DIFFERENT FUSION FREQUENCIES DIFFERENT REALITIES ("IS THIS HEAVEN?")

- NARROW BUT PROFOUND
POWERFUL "GIFTED" COGNITIVE ABILITIES:
- PHOTOGRAPHIC MEMORY, ARTISTIC
ABILITIES AND SUPERB PAINTERS, MENTAL
CALCULATORS, UNIQUE ABILITY TO LEARN
LANGUAGES AND SPEAK WITHOUT
ACCENT, CALENDAR SKILLS, SUPERB
VISUAL MEMORY

QUBITS IN GIFTED SAVANTS

- PARALLEL SELF REACTIVATION OF CORTICO-SUBCORTICAL PROXIMAL AND REMOTE ROWS OF QUBITS WITH PARALLEL SIMULTANEOUS PROCESSING OF ELECTRICAL POTENTIALS AT HIGHER THAN NORMAL CONSCIOUS 40 PER SECOND MICRO-OPERATIONS SPEED WITH VERY SMALL ENERGY LOSS AT DENDRITES
- IN OTHER WORDS: THEY ARE NOT CRAZY... WE ARE THE BLIND!

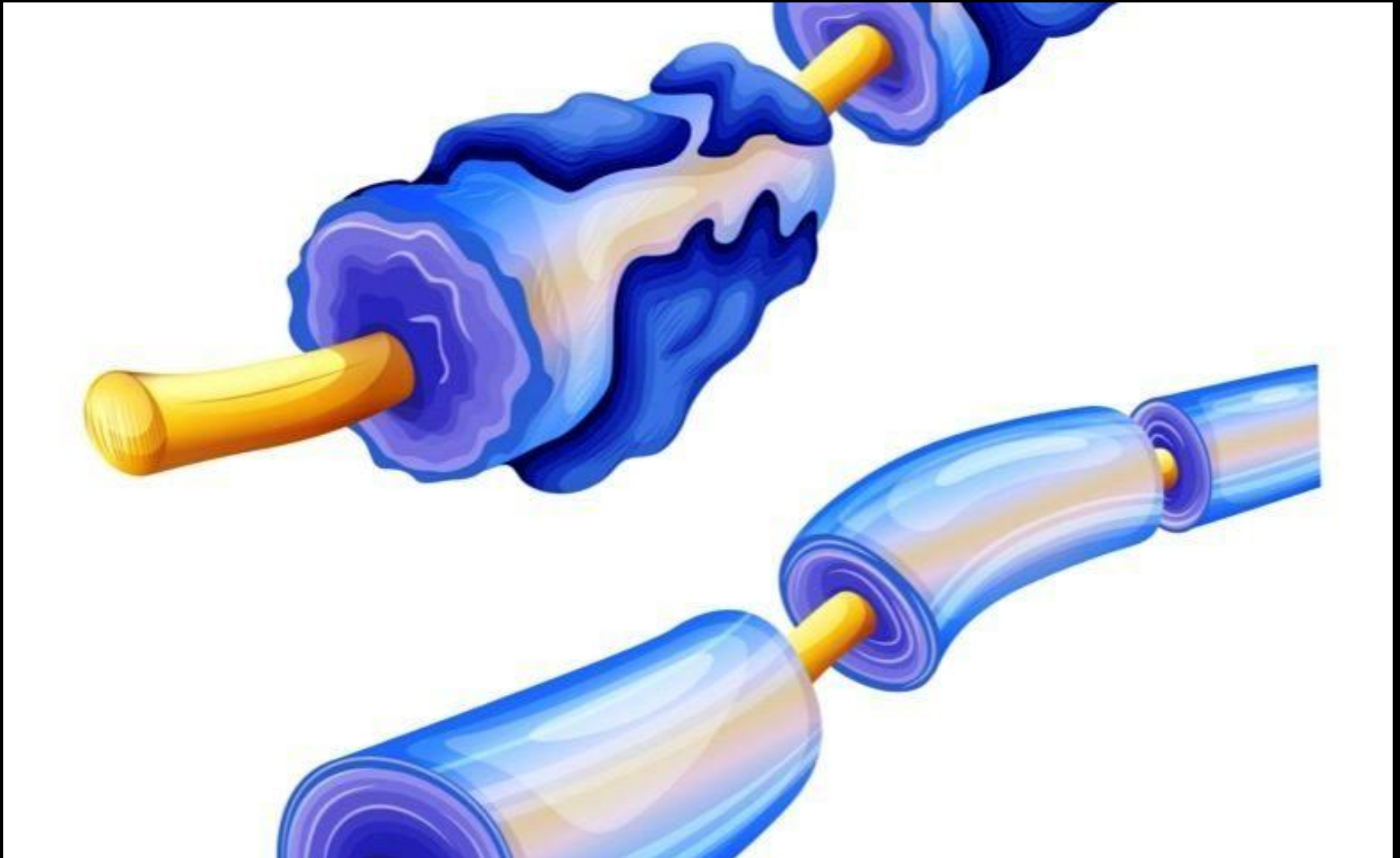
SUNFLOWER USES FIBONACCI GEOMETRY



HIGH ARCHES FEET & GLAUCOMA



JUVENILE GLAUCOMA & CMT 4B (R HIRANO ET AL 2004)



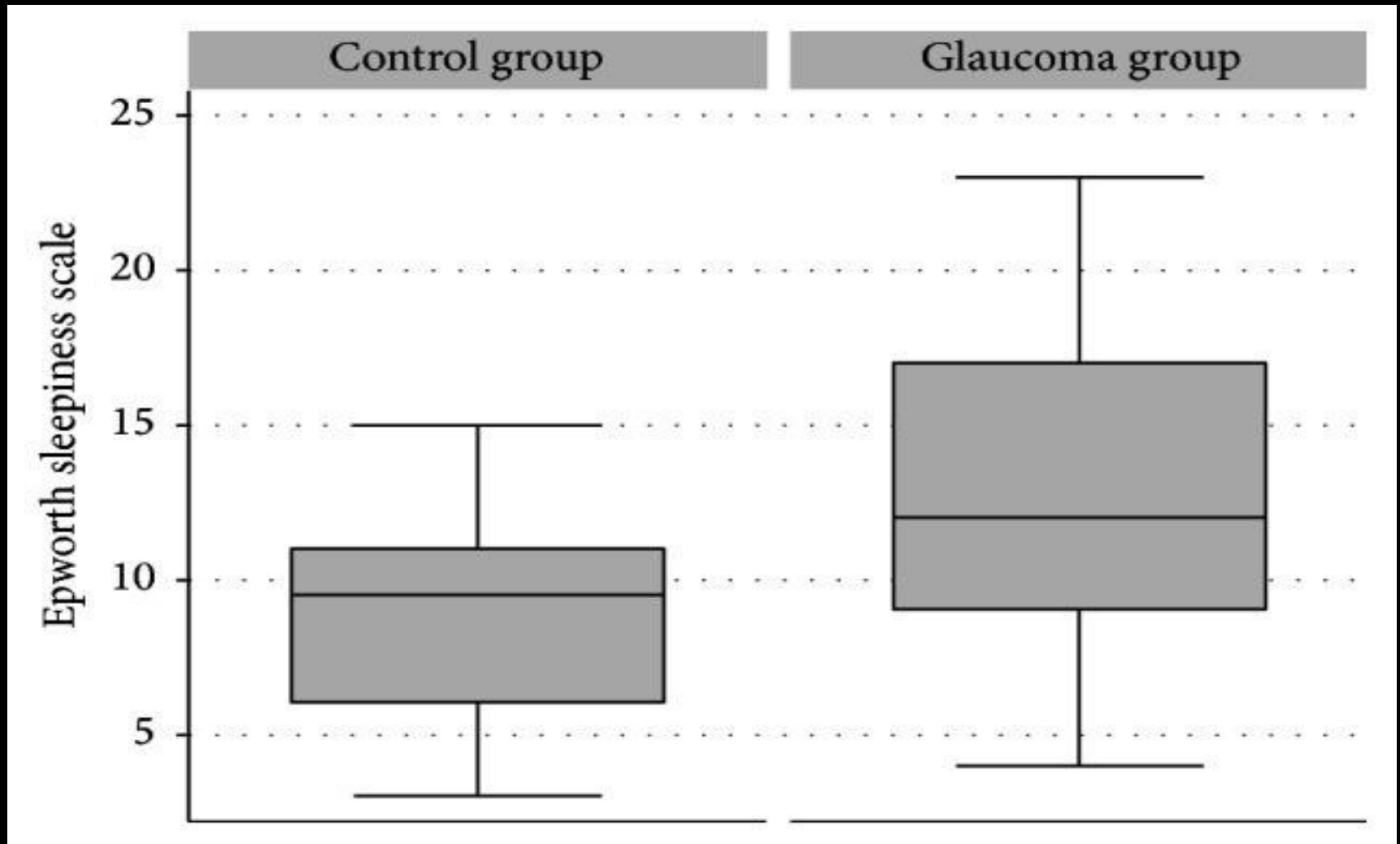
HIGH ARCHES FEET & GLAUCOMA



PATIENTS WITH GLAUCOMA, NORMAL VISUAL EXAMS & DAYTIME DROWSINESS

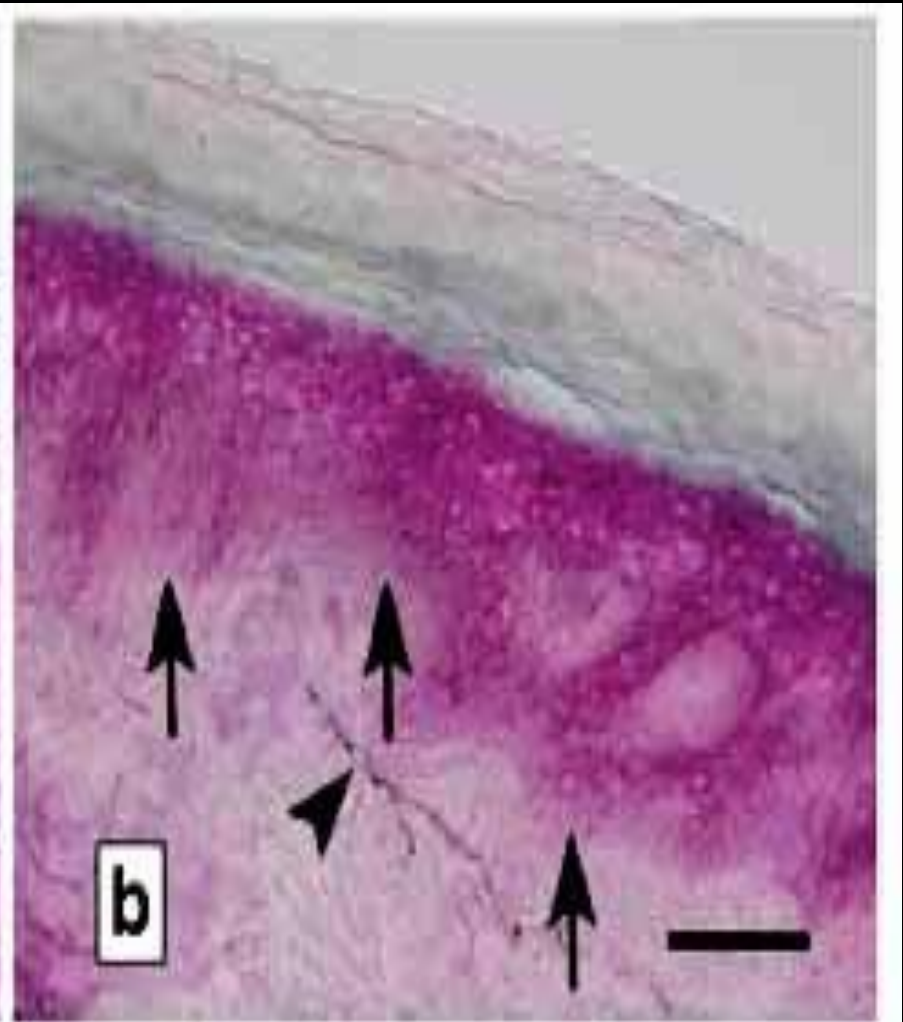
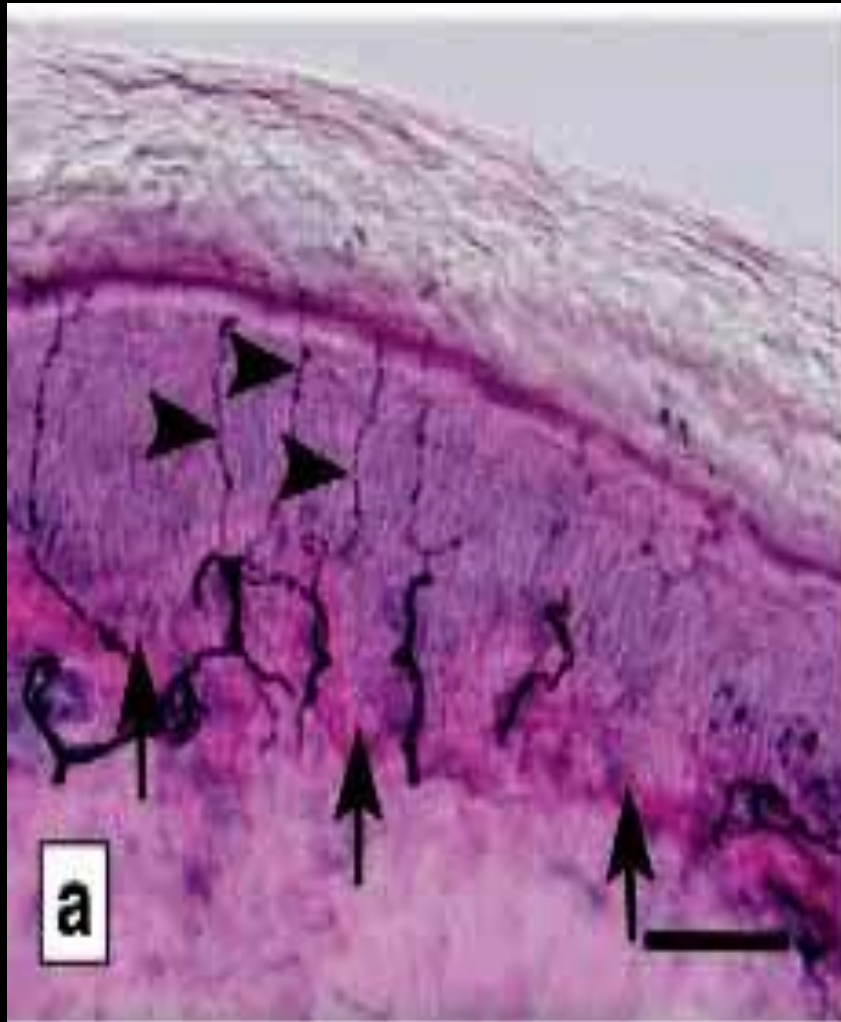
- HIGH EYE PRESSURES (+-30)
- DAYTIME DROWSINESS FROM GLAUCOMA AND IN NO MEDICATIONS???
- NO OSA, OBESITY, NARCOLEPSY OR NOCTURNAL SEIZURES
- CAUSED BY "SUBCLINICAL" INVOLVEMENT OF THE MELANOPSIN CONTAINING IP-RETINOGLIANGLIONIC NEURONS ALTERING NOCTURNAL SLEEP DUE ABNORMAL CIRCADIAN **SUBCONSCIOUS** LIGHT PERCEPTION

SLEEPINESS IN GLAUCOMA AND THE **ip**-RG PATHWAY



SKIN NERVE BIOPSY

FIBROMYALGIA



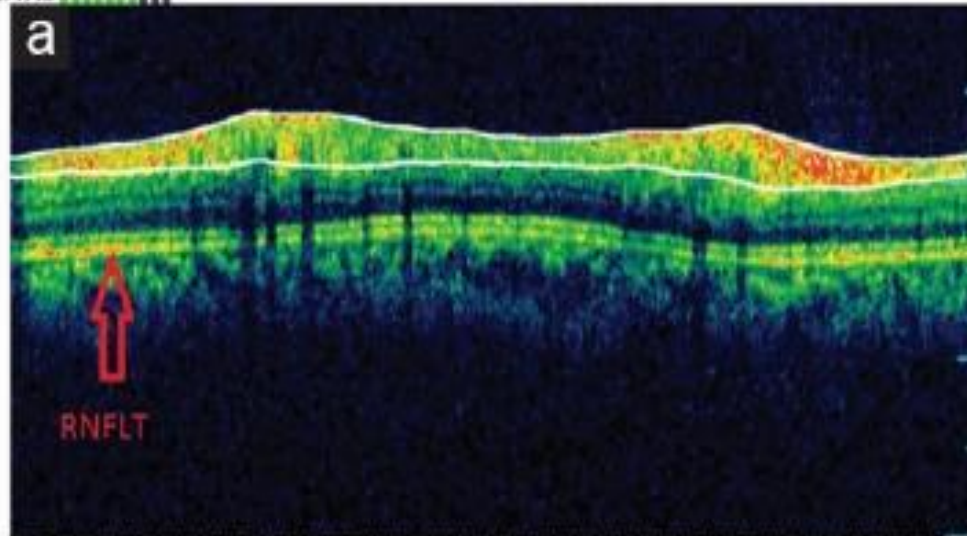
FIBROMYALGIA AND GLAUCOMA?

- GARCIA-MARTIN, ET AL, IN 2016, REPORTED RETINAL NERVE FIBER LAYER AXONAL THINNING IN FIBROMYALGIA ESTABLISHED BY OPTICAL COHERENCE TOMOGRAPHY (OCT) THAT CORRELATES WITH THEIR KNOWN SLEEP DISORDER, GENERALIZED PAIN, FATIGUE AND LIGHT SENSITIVITY IN THIS FREQUENT CONDITION

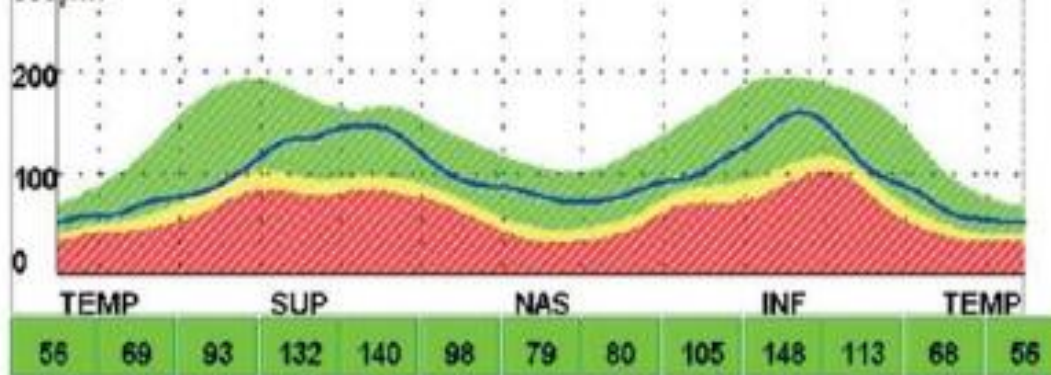
RETINAL NERVE FIBER LAYER ATROPHY IN FIBROMYALGIA

SNR: 7/10

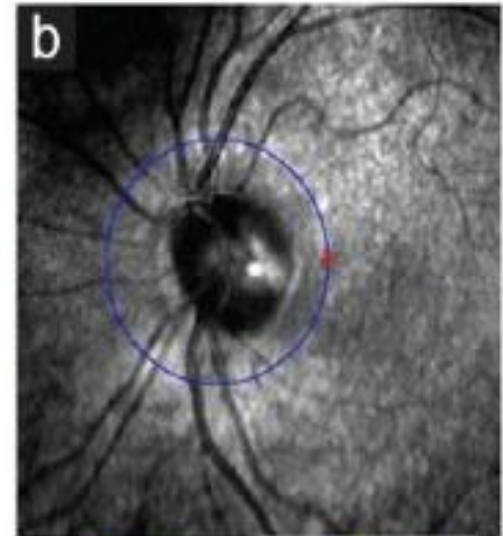
a



300 μ m



b



CHRONIC PAIN AND PHOTOSENSITIVITY LINK

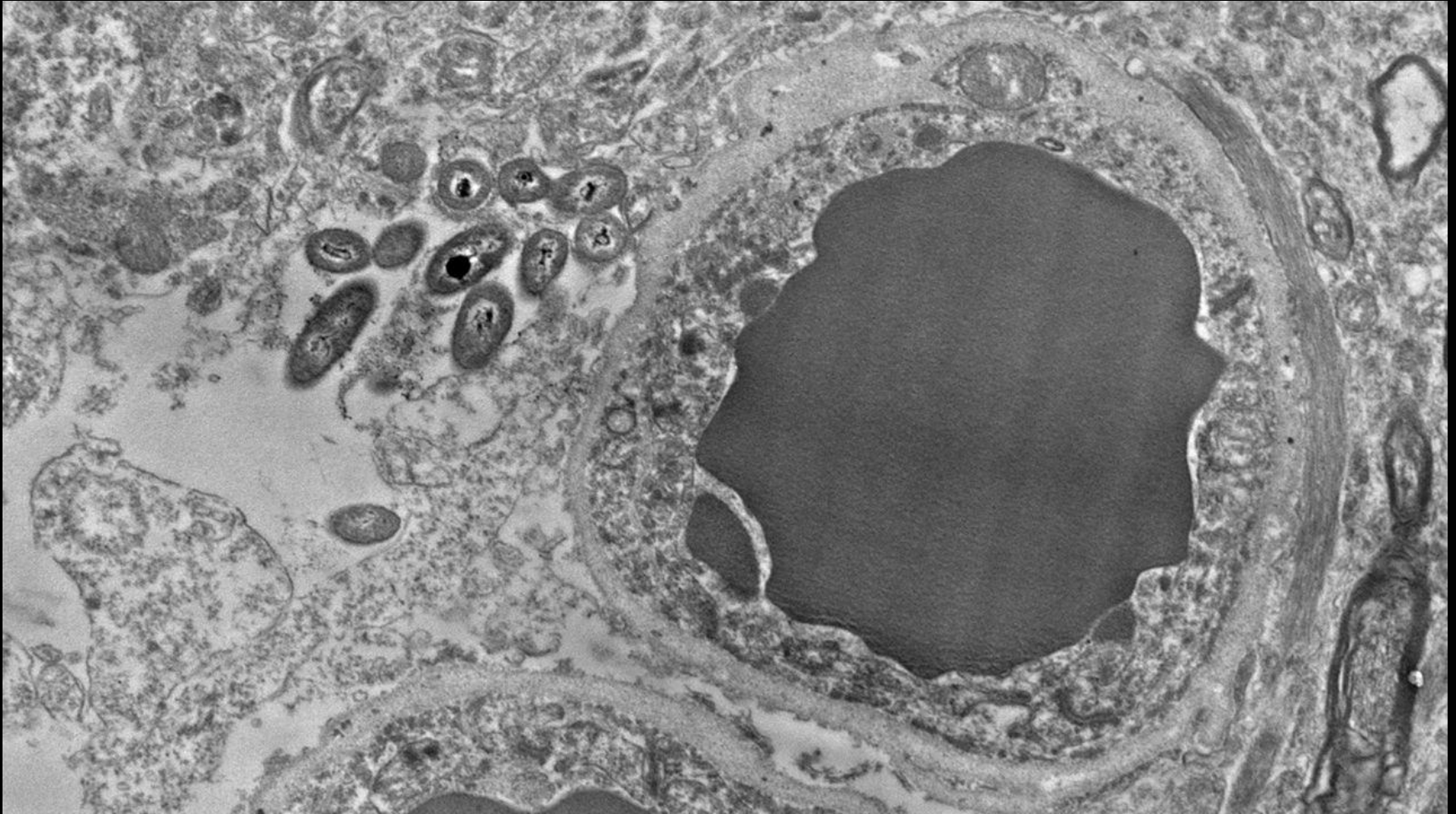
- BASIS FOR PHOTSENSITIVITY AND EYE PAIN IN MIGRAINE
- OVERLAP BETWEEN MIGRAINE AND FMA ON BASIS OF A DYSFUNCTIONAL PAIN MODULATING CIRCUIT INVOLVING THALAMUS, TRIGEMINAL GANGLIA, OLIVARY NUCLEUS, DORSAL HORN OF THE SPINAL CORD & VENTROMEDIAL MEDULLA NEURONS

INTESTINAL DYSBIOSIS (SIBO IBS) WITH SECONDARY UVEITIS

37 YEARS OLD MALE WITH HX. OF IBS
DIARRHEA TYPE

- TOLD BY GI DOCTOR HE HAS INTESTINAL DYBIOSIS TO ACCOUNT FOR HIS IBS SYMPTOMS SO WHAT DOES THAT TO DO WITH THE EYES???
- T CELL LYMPHOCYTES ARE CROSS-REACTING WITH RECEPTORS AGAINST PROTEINS IN THE GITRACT AND IN THE EYES POSSESING A SIMILAR RECEPTOR STRUCTURE

IS GUT BACTERIA MAKING A SECOND HOME IN OUR BRAINS?



TRANSIENT BLINDNESS IN A FOOTBALL PLAYER (1)

- 21 YEAR OLD MIAMI HURRICANES (UM) FOOTBALL PLAYER WITH HISTORY OF MIGRAINE PRESENTED WITH VERY SEVERE GLOBAL PULSATILE HEADACHE. NO FEVER.
- NO SIGNIFICANT PERSONAL HX. NO FAMILY HX. OF CEREBRAL ANEURYSMS
- NORMAL NEURO EXAM, HEAD CT AND EEG
- IS THIS A "SENTINEL HEADACHE" (NEAR RUPTURE CEREBRAL ANEURYSM)?

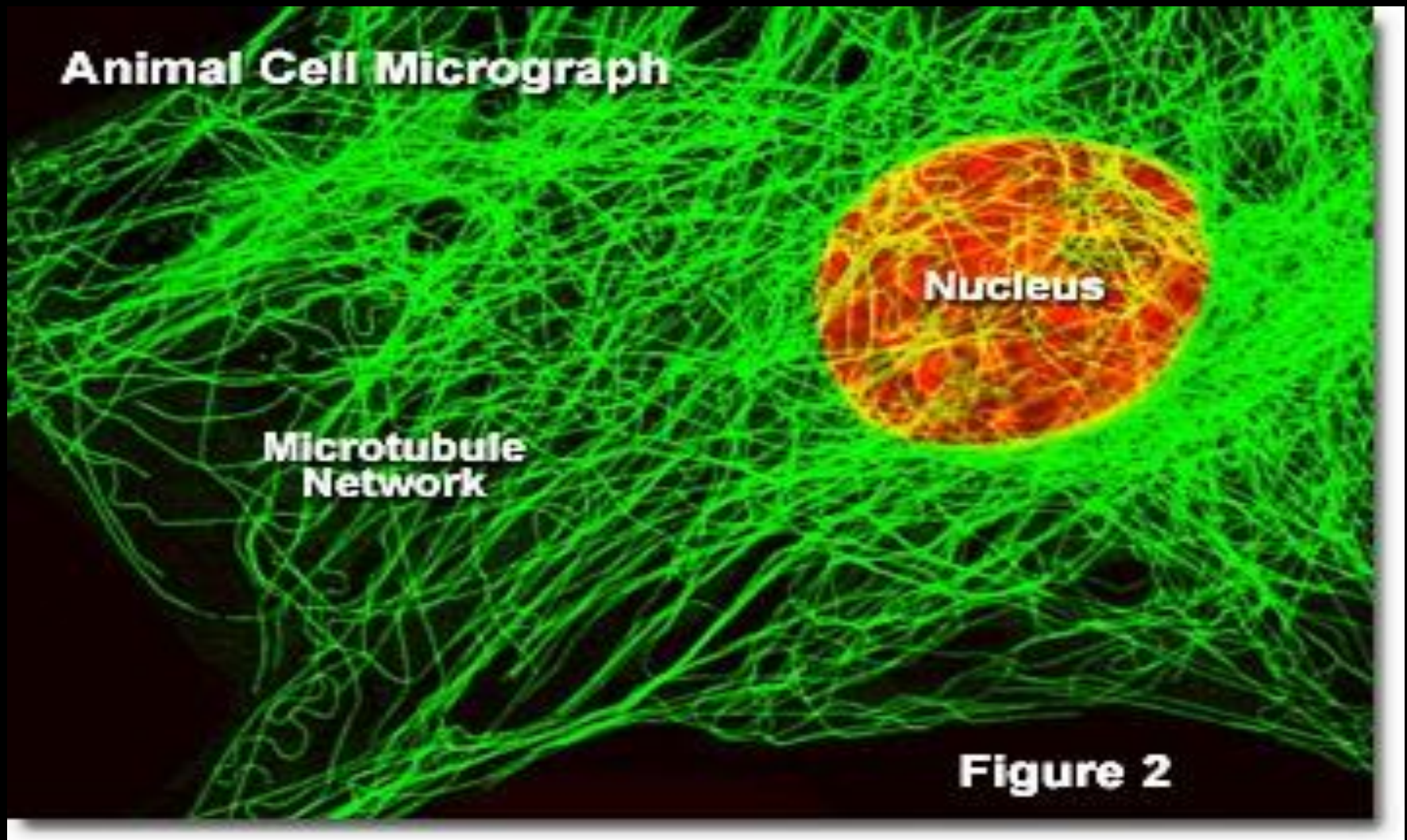
TRANSIENT BLINDNESS IN A FOOTBALL PLAYER (2)

- NO LP BECAUSE NO FEVER AND NO STIFF NECK
- CEREBRAL ANGIOGRAMS TO R/O IC ANEURYSM PRECIPITATED TOTAL BLINDNESS FOR ONE HOUR!
- CAUSE?: VERTEBROBASILAR OCCIPITAL EMBOLIZATION, CEREBRAL VASOSPASM, IC ARTERIAL DISSECTION, ICTAL BLINDNES, HYSTERIA???

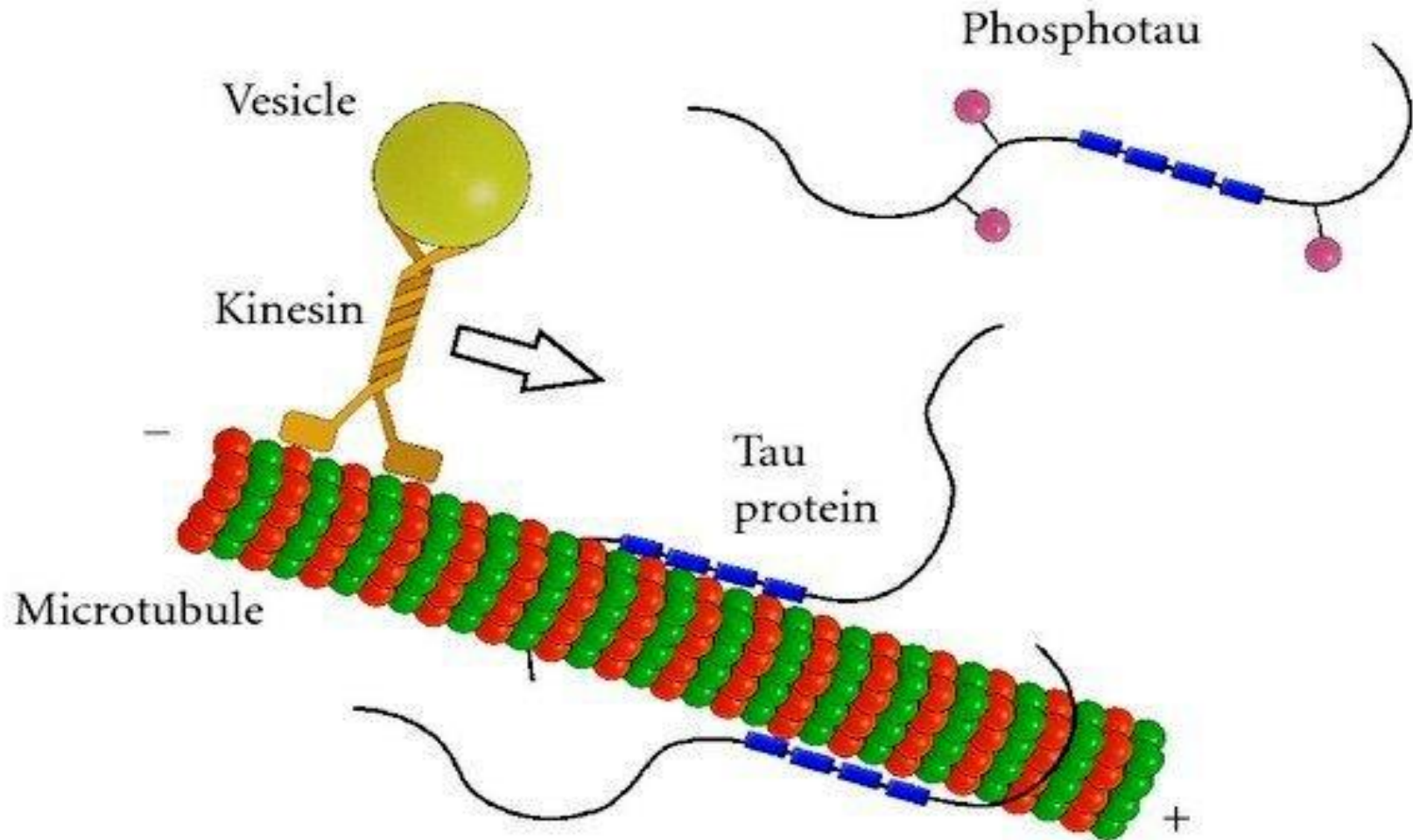
TRANSIENT BLINDNESS IN A FOOTBALL PLAYER(3)

- DIAGNOSIS: "FOOTBALLER MIGRAINE"
"BASILAR ARTERY MIGRAINE" FROM
CHRONIC CNS AND CERVICAL TRAUMA
- DUE TO "CORTICAL SPREADING
DEPRESSION" OR CSD
- ON BASIS OF CERVICAL SYMPATHETICS
NERVE DAMAGE, VASCULITIS WITH
SECONDARY PLATELET RELEASE OF
VASOACTIVE SUBSTANCES, IE.,
SEROTONIN, BRADYKININ AND HISTAMINE

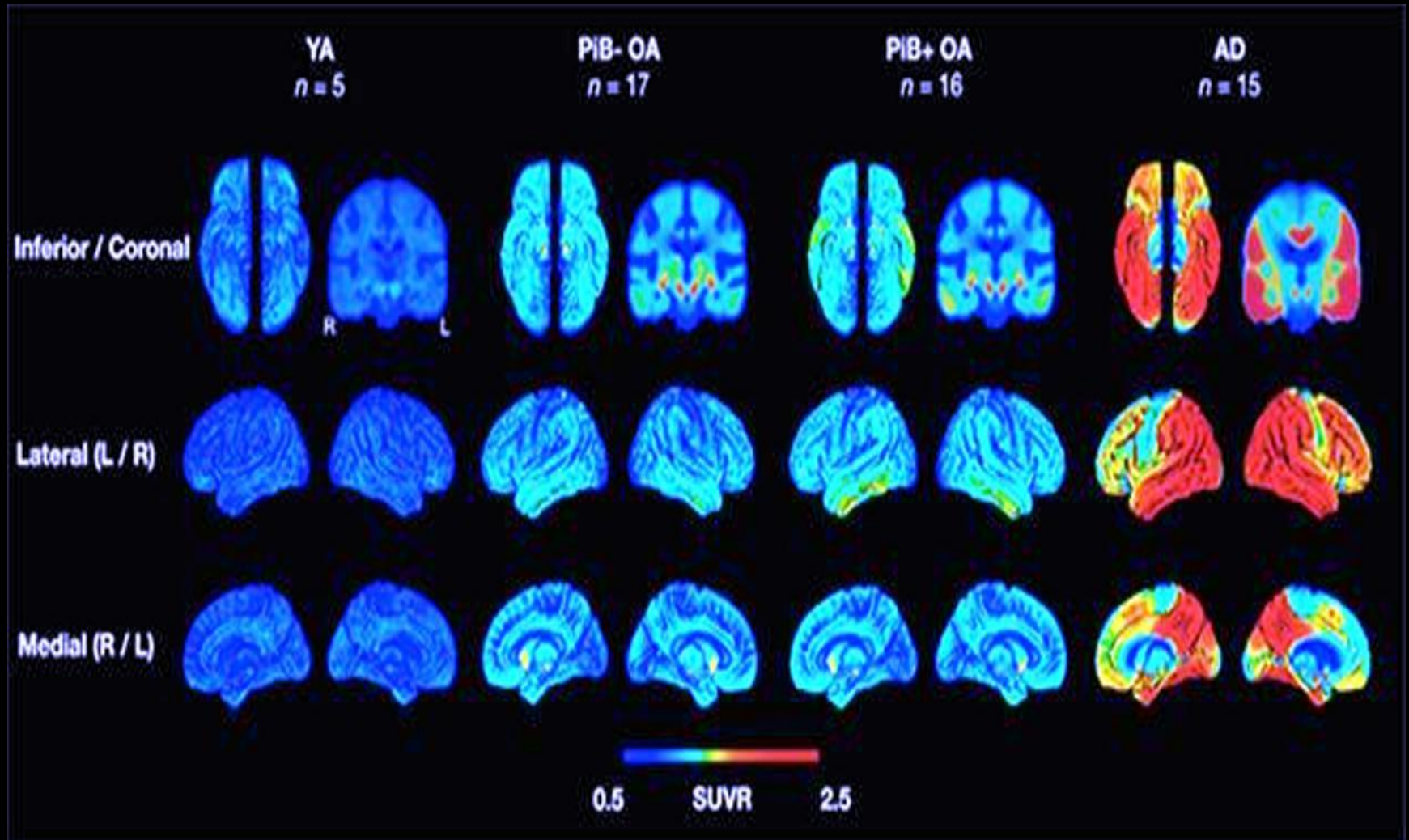
POSTTRAUMA OCCIPITAL TAU ACCUMULATION:AD OR PD LATER



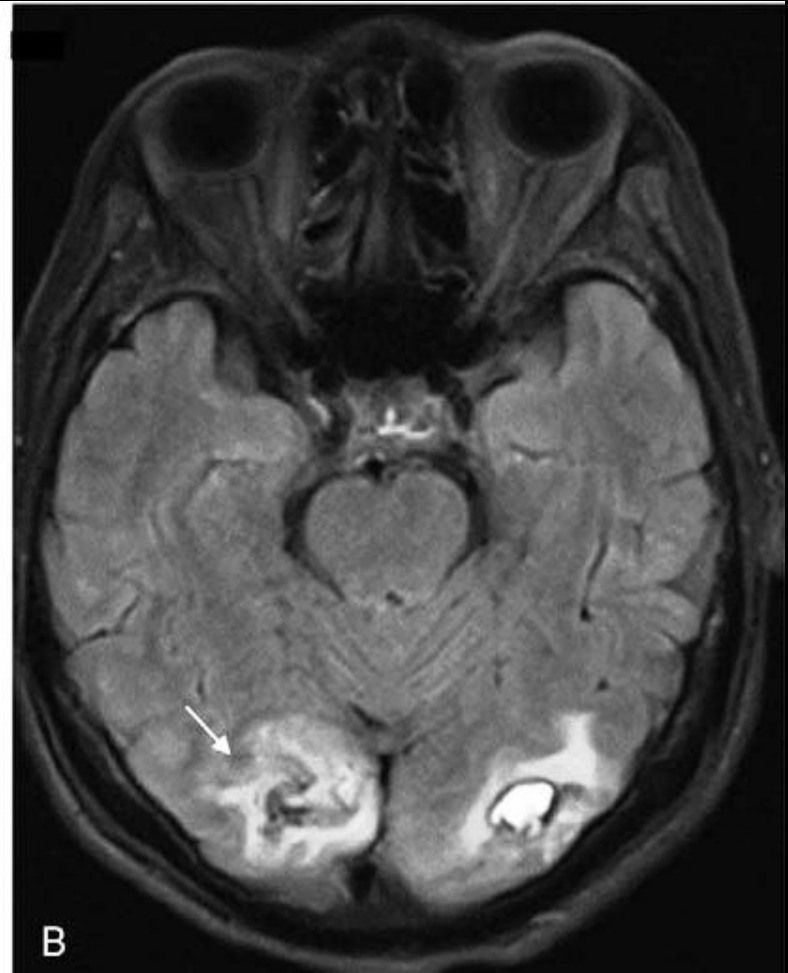
OCCIPITAL TAU IN BRAIN TRAUMA



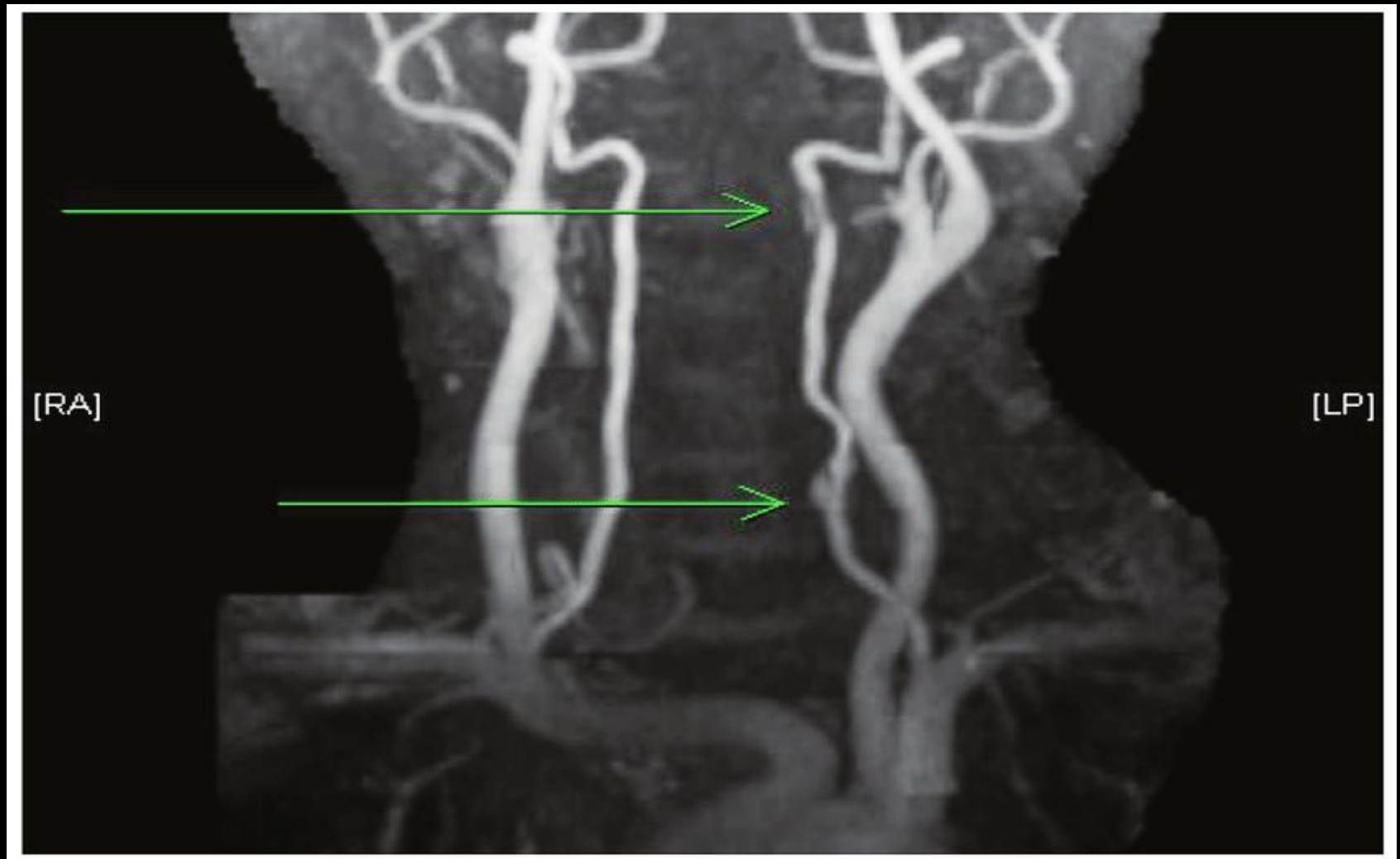
OCCIPITAL TAU ACCUMULATION IN CHRONIC CNS TRAUMA, BAM?



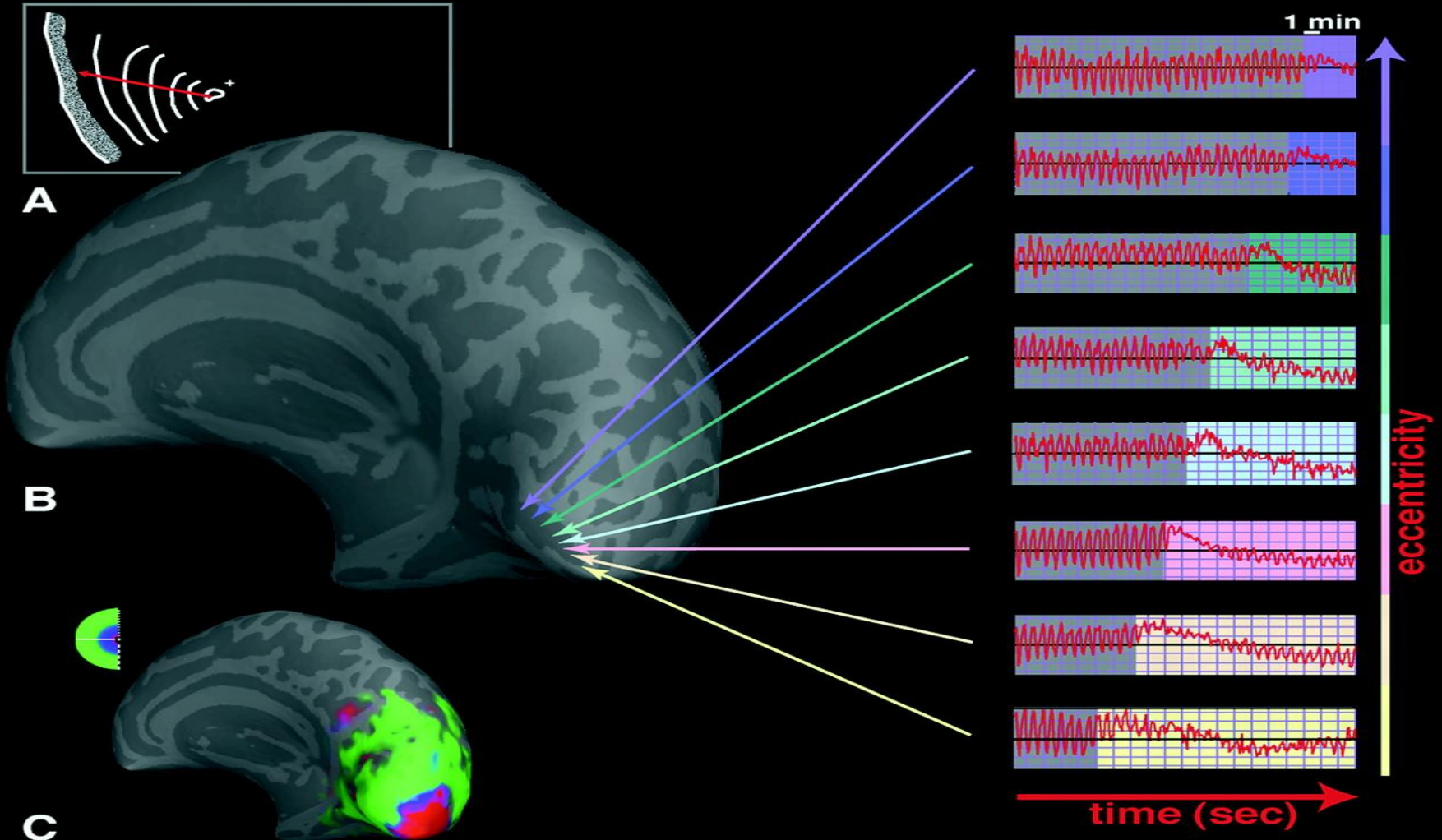
OCCIPITAL LOBE STROKE



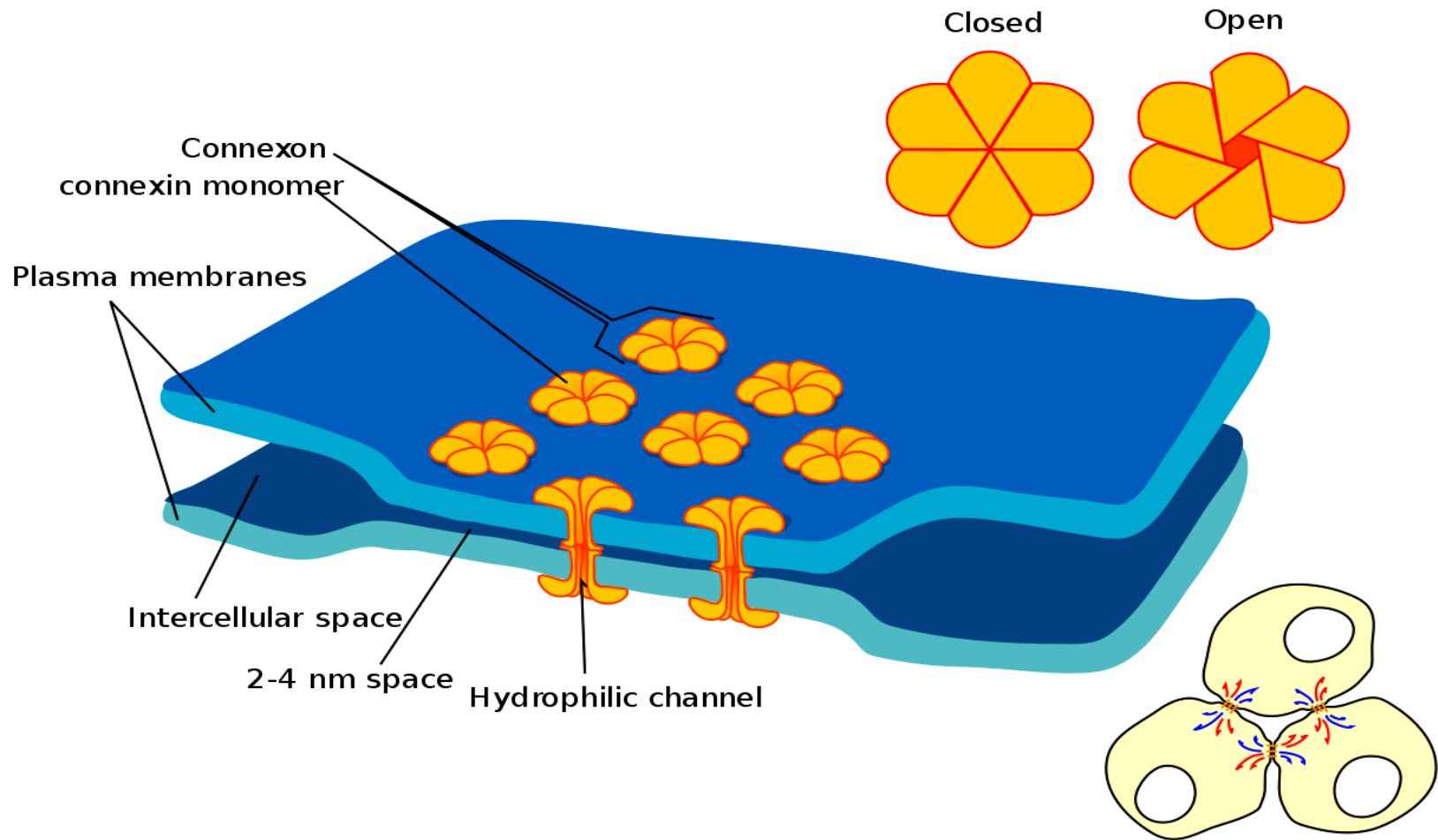
POST TRAUMATIC VERTEBRAL ARTERY DISSECTION



CORTICAL SPREADING DEPRESSION IN MIGRAINE



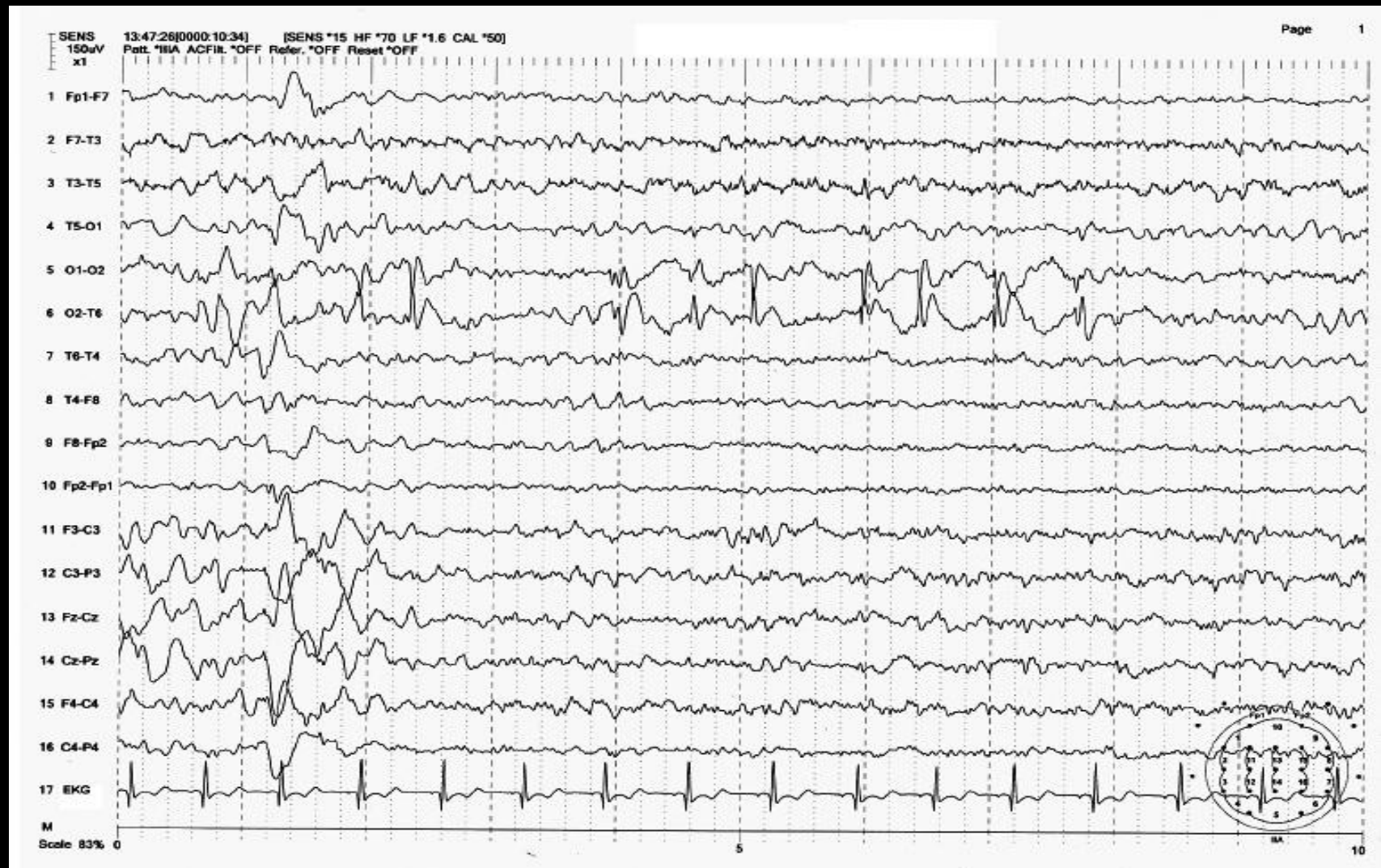
CSD AND GAP JUNCTIONS



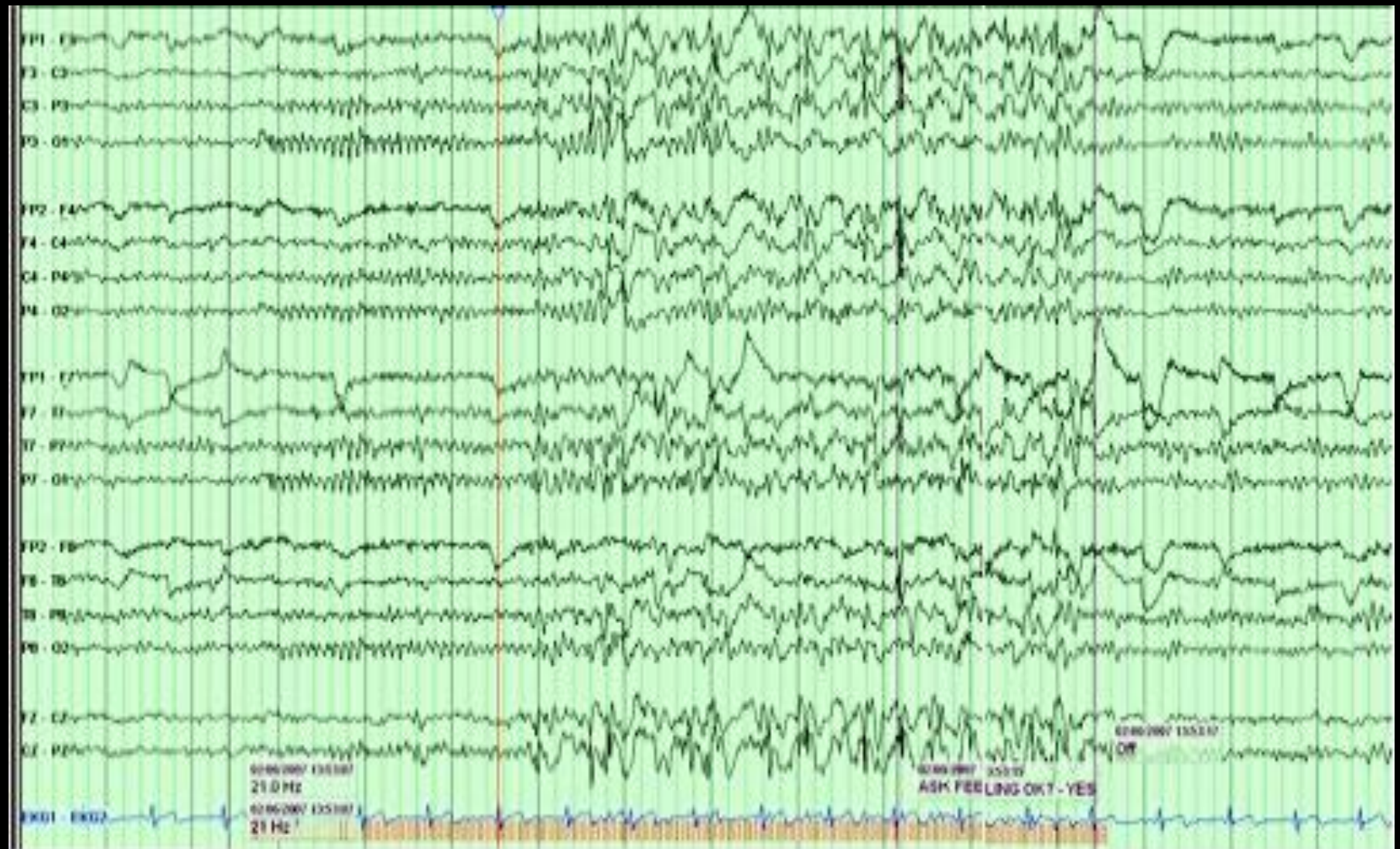
VISUAL SNOW



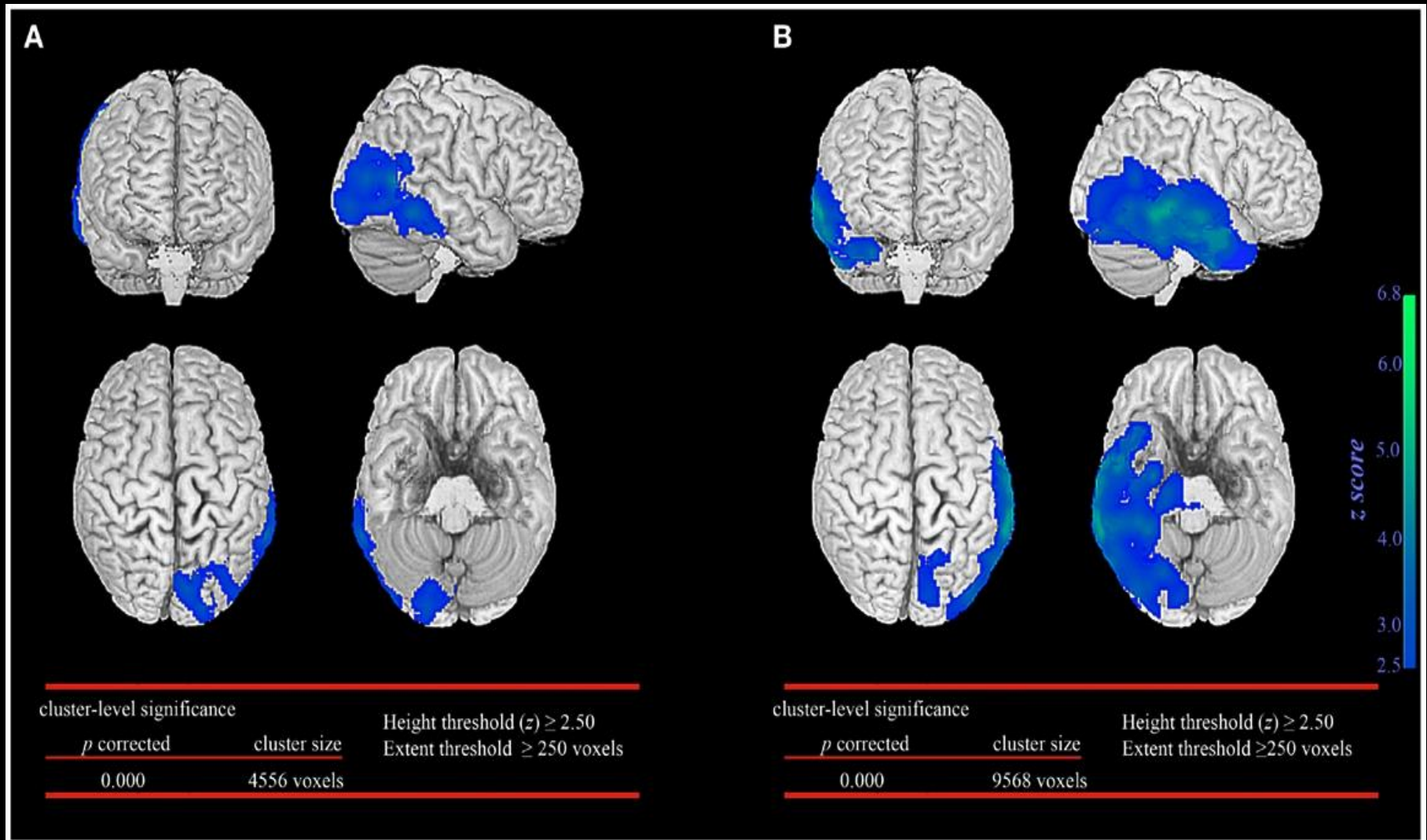
Child with periodic flashes: Benign occipital lobe epilepsy of childhood



PHOTOPAROXYSMAL EPILEPTIC NYSTAGMUS-ICTUS EMETICUS



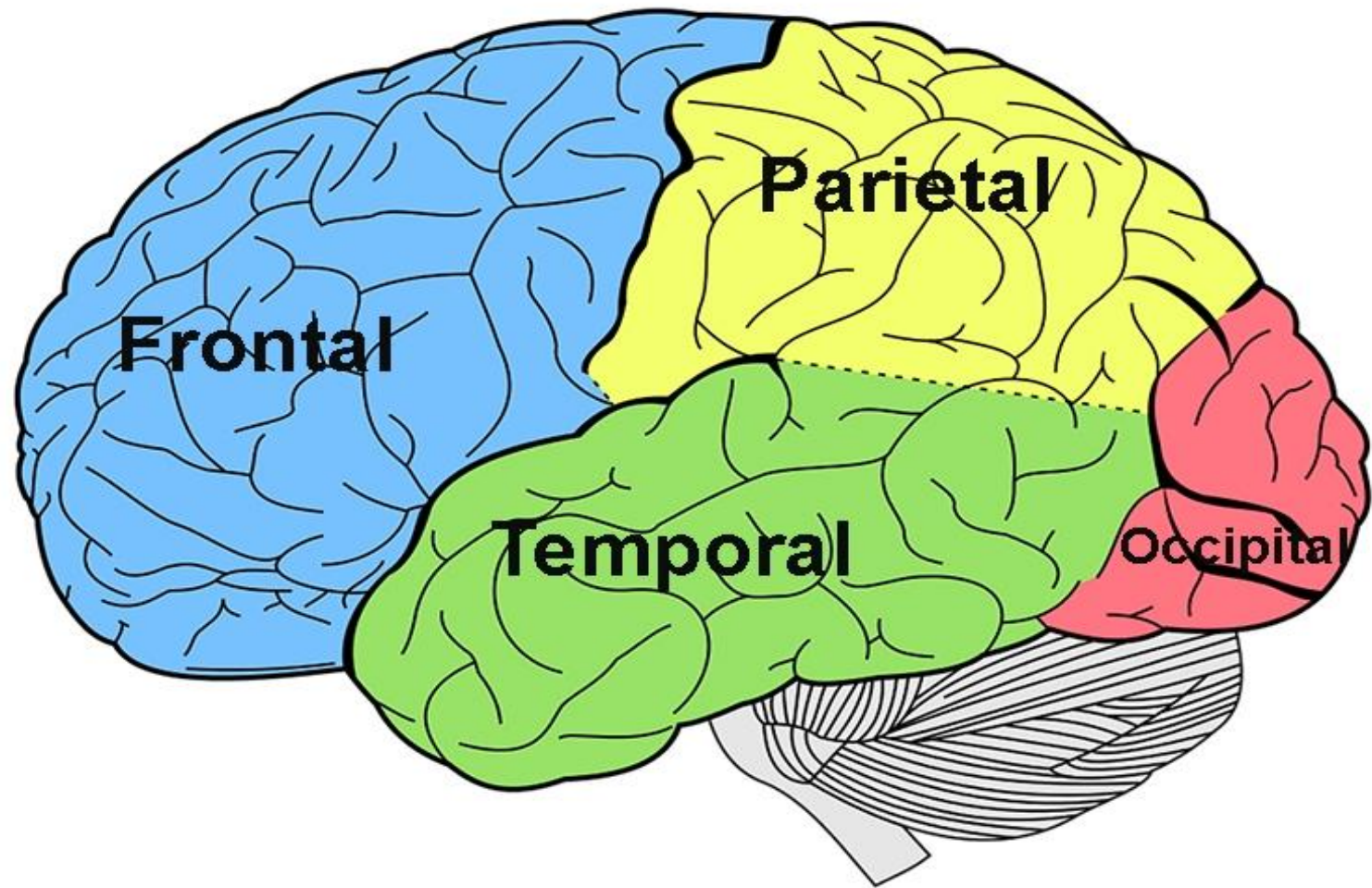
OCCIPITAL SZs INTERICTAL PET (A-VISUAL,B-WITH MOTOR AUTOMATISMS FROM TEMPORAL LOBE)



ENTOMOPIA: PECULIAR FORM OF POLYOPIA DUE TO SZ OR LESION



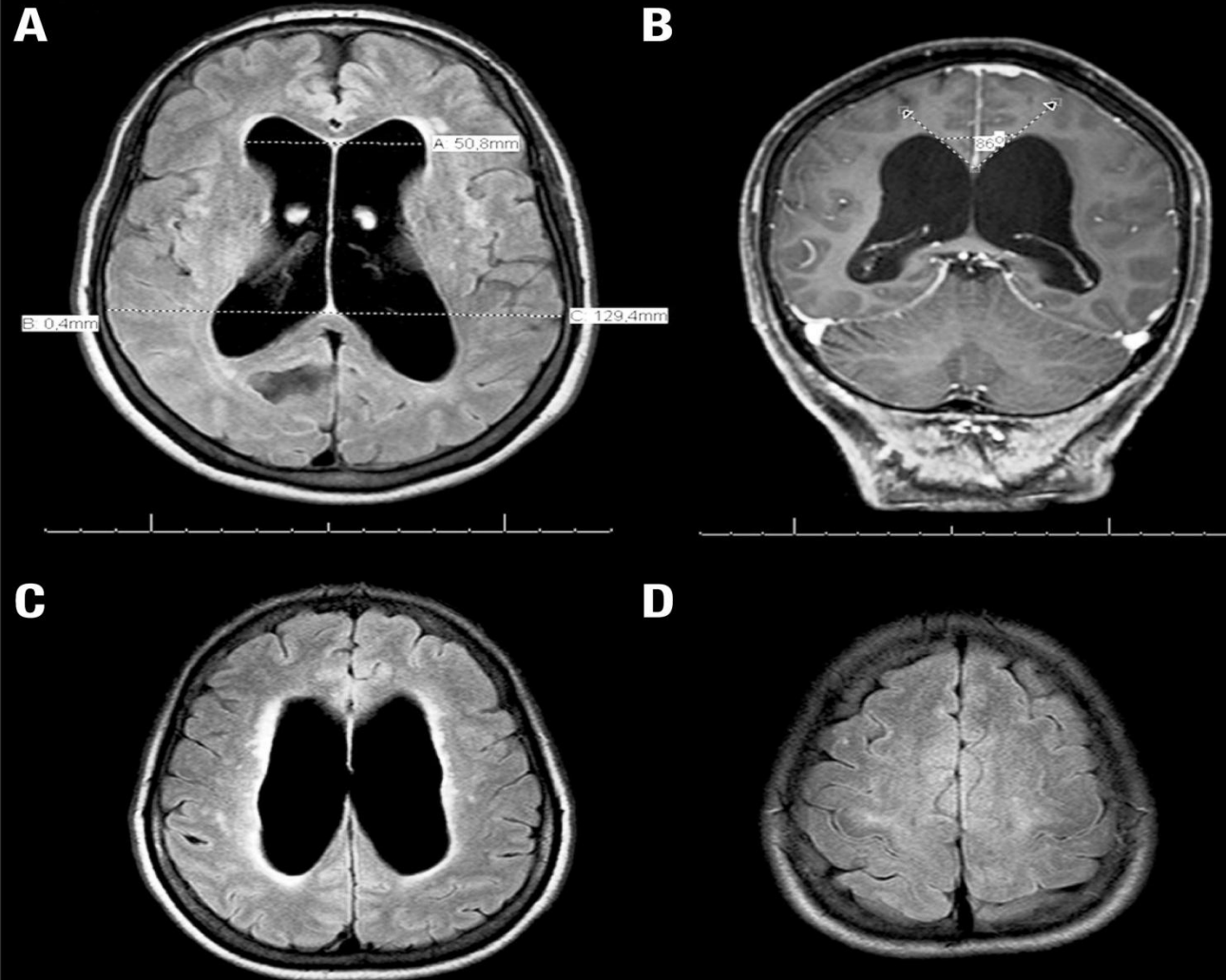
VENTRAL & DORSAL VISUAL PATHWAYS: LOCATION V/S IDENTITY



CHARLES BONETT SYNDROME

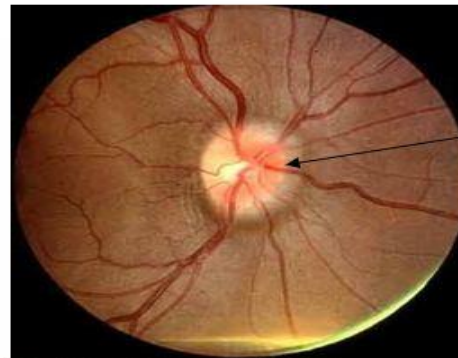
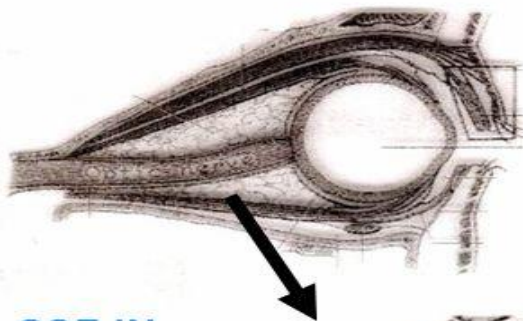


PATIENT WITH NPH & VP SHUNT HAS PERIODIC LOSS OF VISION (Lee AG, 1996)

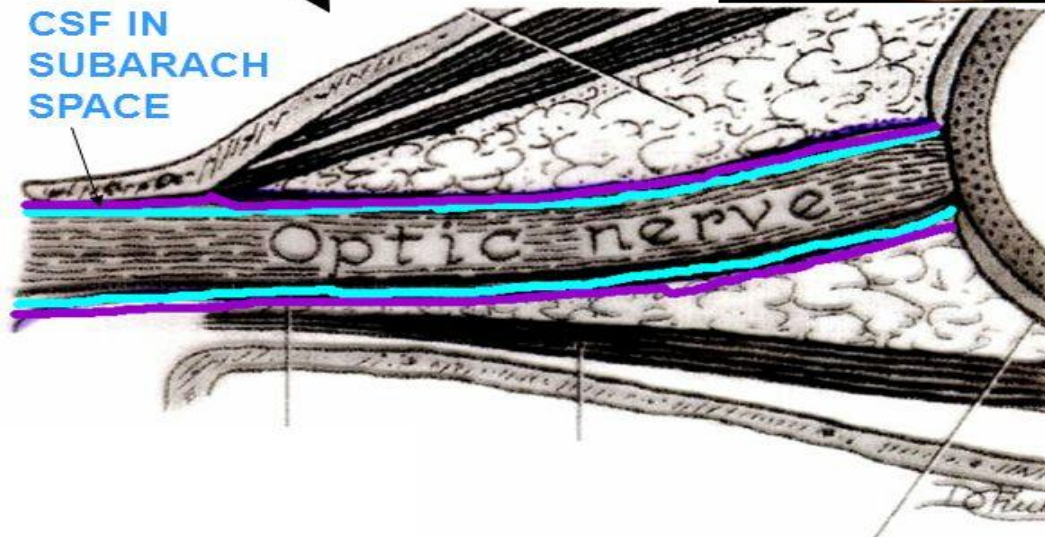


INCREASED CSF PRESSURE AROUND OPTIC NERVE MAY CAUSE CONDUCTION BLOCK

OPTIC NERVE FUNCTION COMPROMISED BY INCREASED CSF PRESSURE



PAPILLEDEMA
- engorgement
of retinal veins
(correspond to
branches of
central artery)



**DURA &
SUBARACHNOID SPACE
(CSF) EXTEND AROUND
OPTIC NERVE;
INCREASE IN CSF CAN
EFFECT VISION**

Clinical - slow onset;
headaches

PHANTOM EYE PAIN

- 30% OF PATIENTS WILL EXPERIENCE PHANTOM PAIN AFTER ENUCLEATION WITH OR WITHOUT ASSOCIATED VISUAL HALLUCINATIONS ON BASIS OF CENTRAL REINNERVATION OF DENNERVATED CORTICAL AREA BY NEIGHBORING CORTEX ALONG WITH ITS PERIPHERAL, SUBCORTICAL CONNECTIONS(<GABA>DA)
- FACILITATED BY PRESURGICAL EYE PAIN!

SIGMUND FREUD (1856-1939)



THANK YOU!

