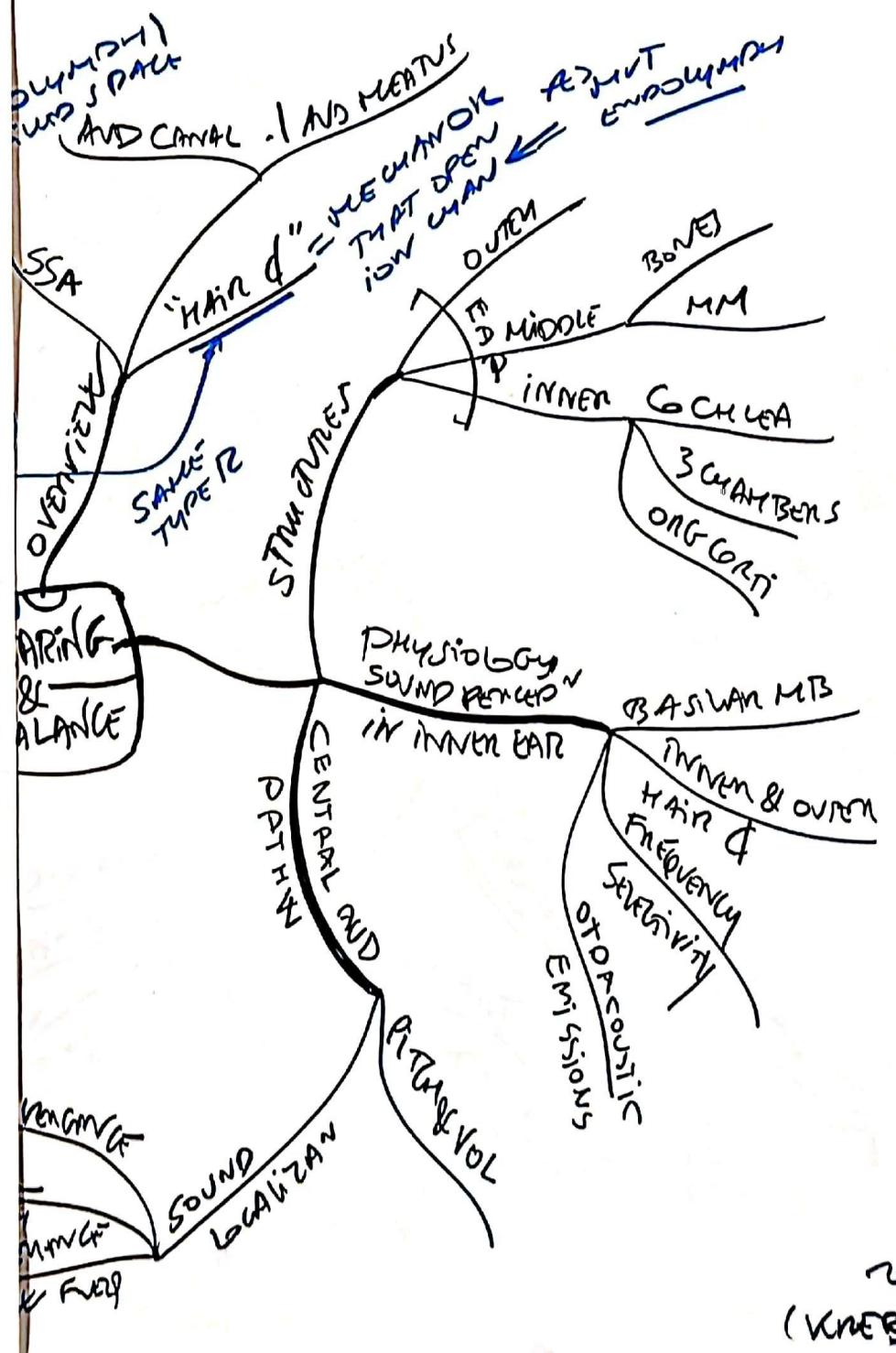


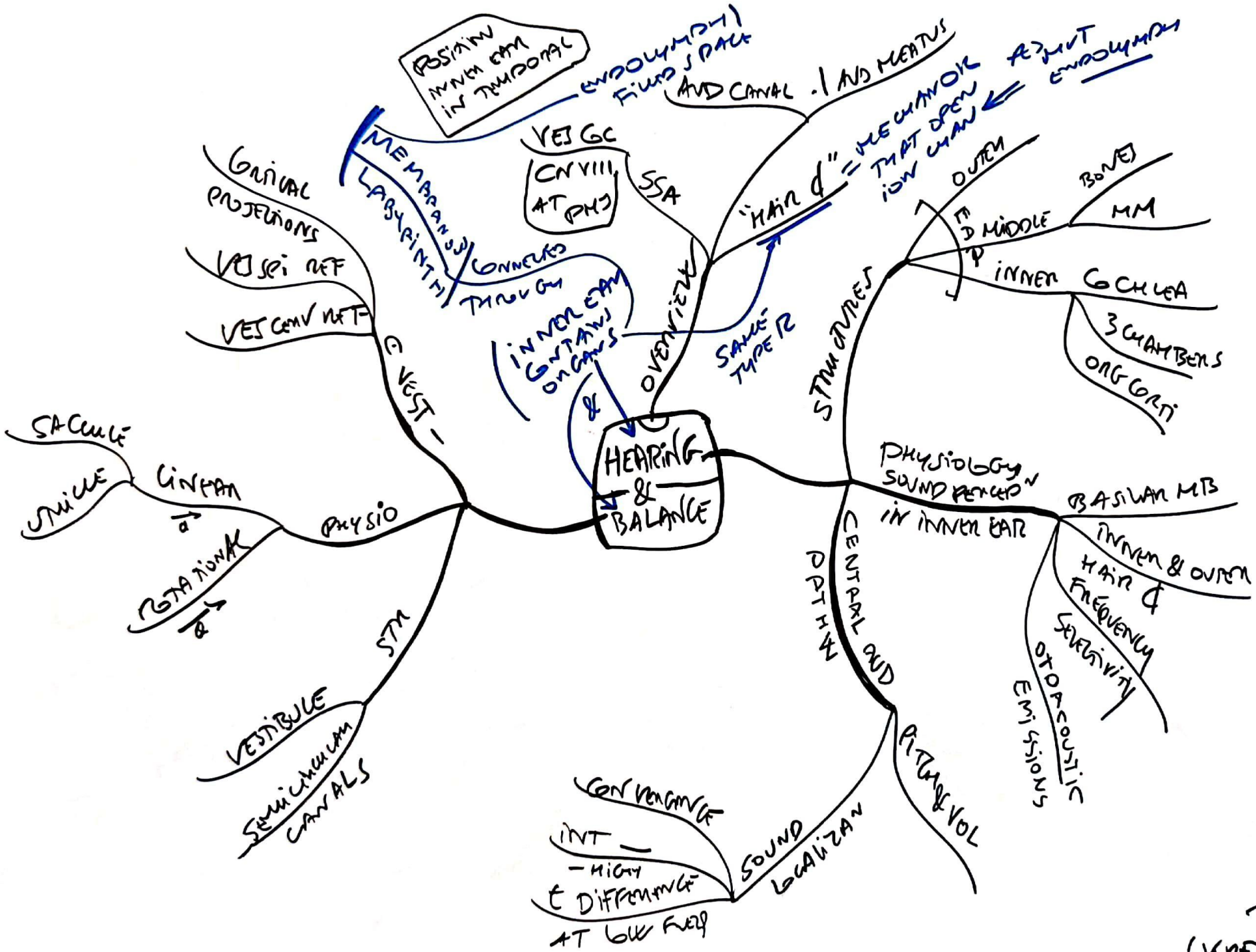
# HEARING & BALANCE

SA M



2017

(KNEBS)



(KNEB) 2017



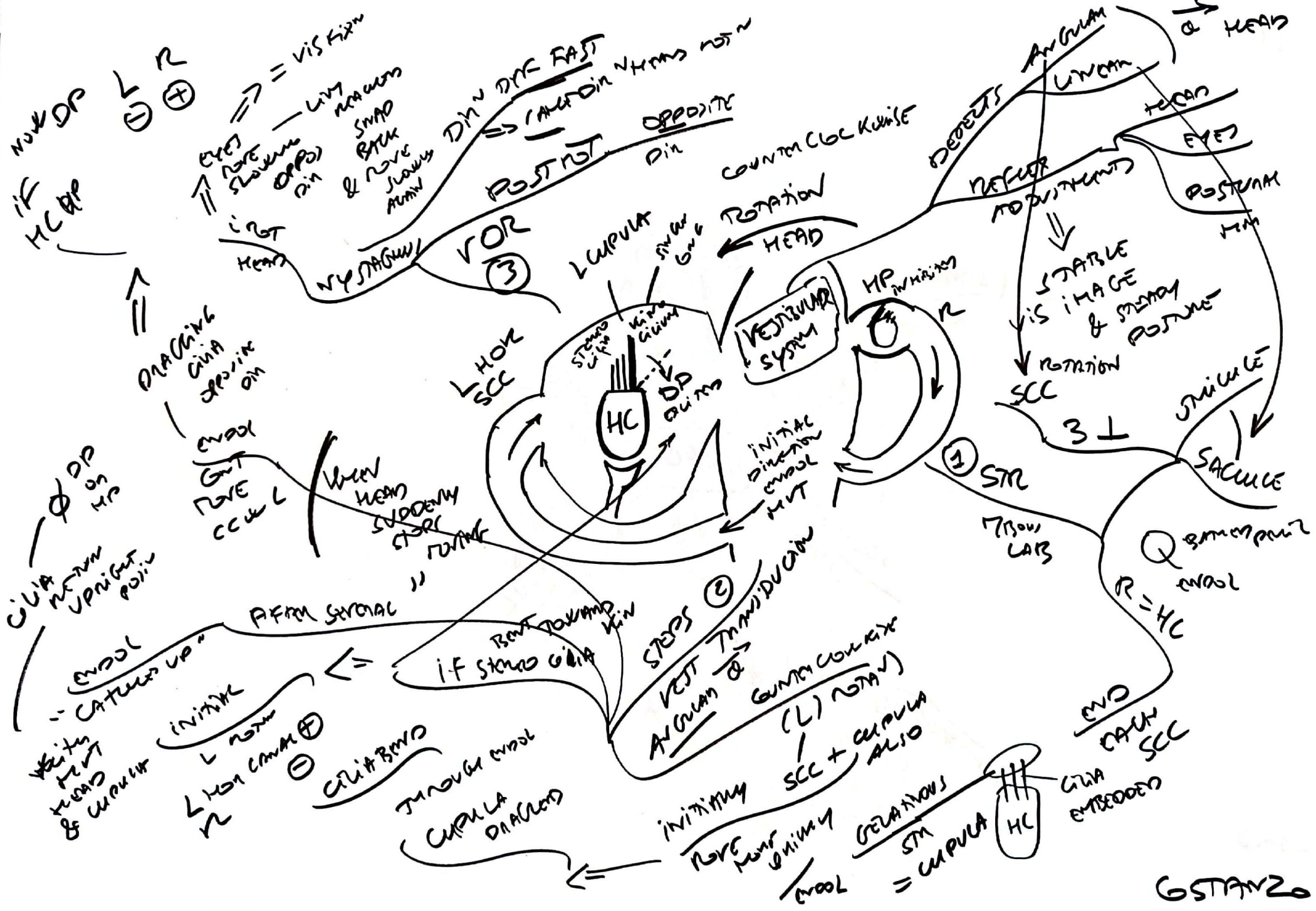






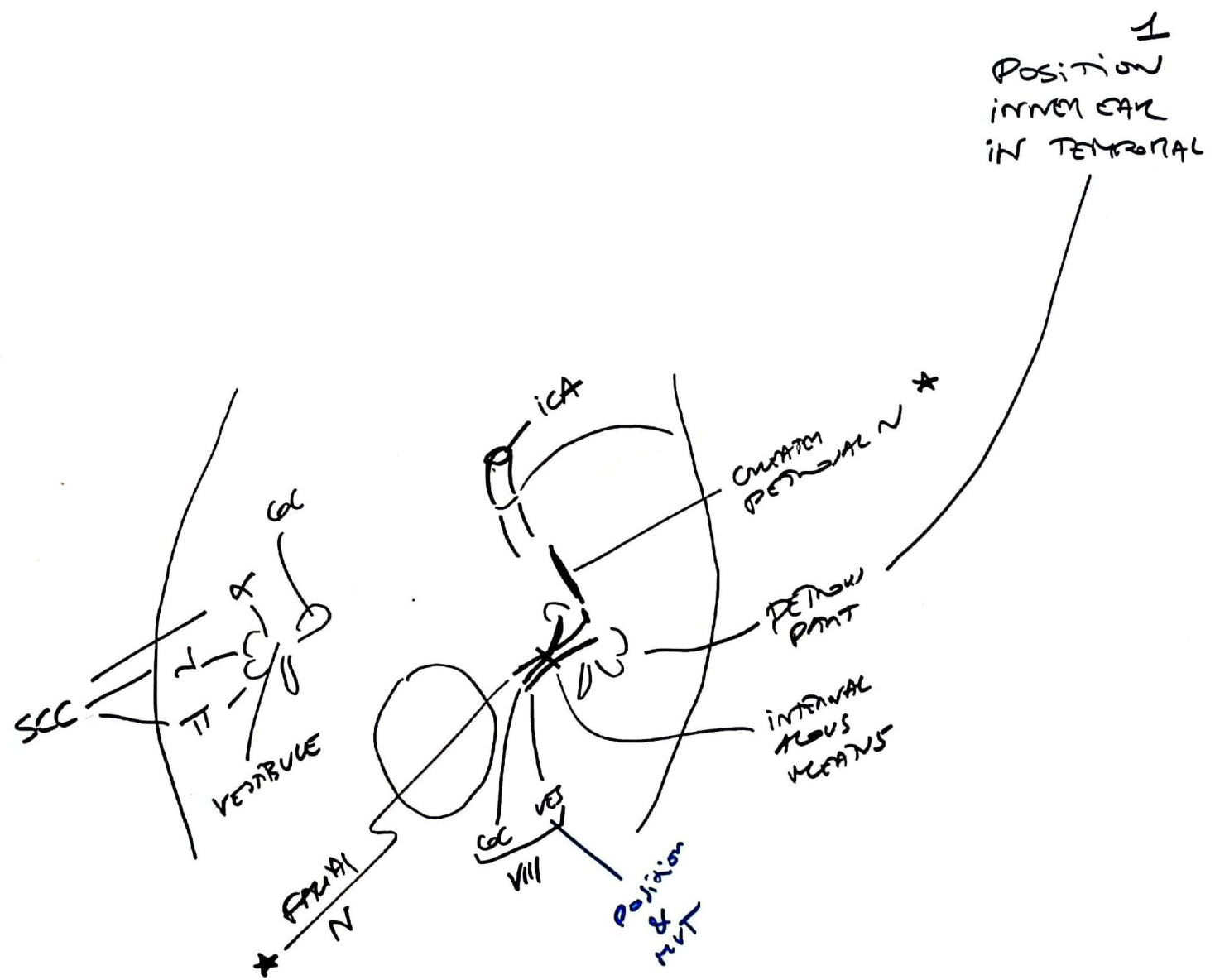






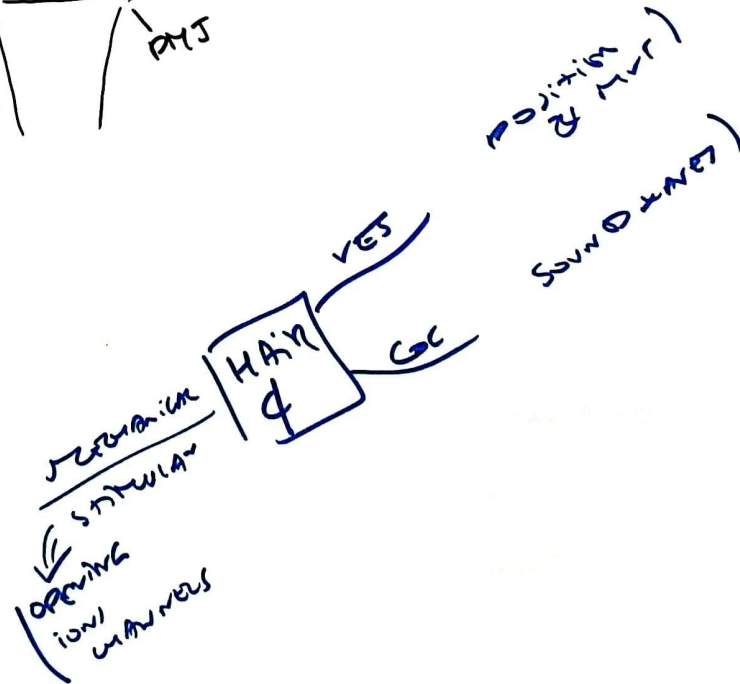
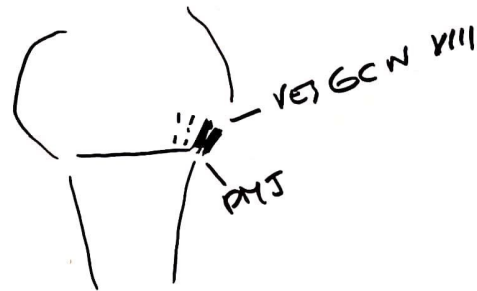
GSTANZO





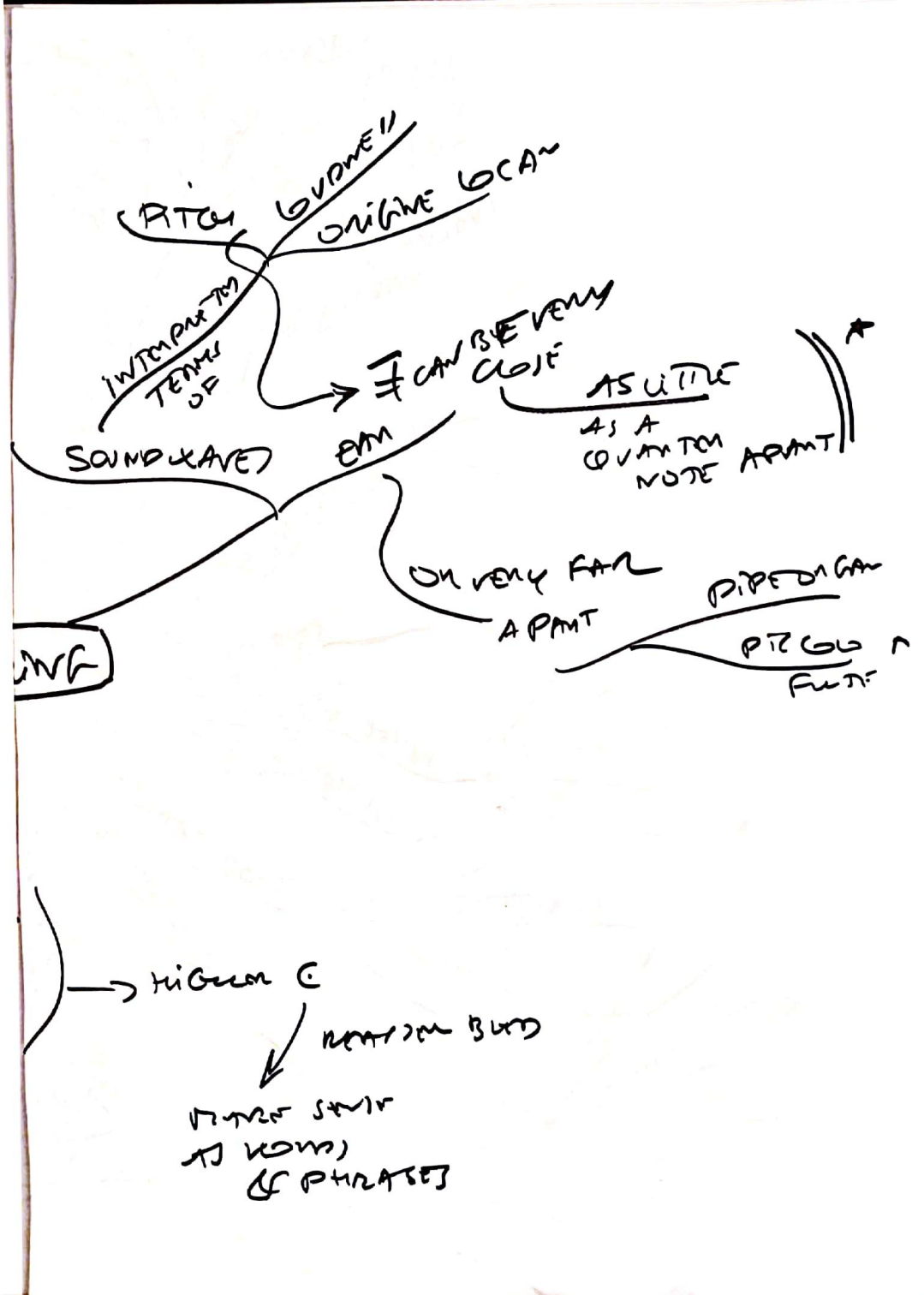
2

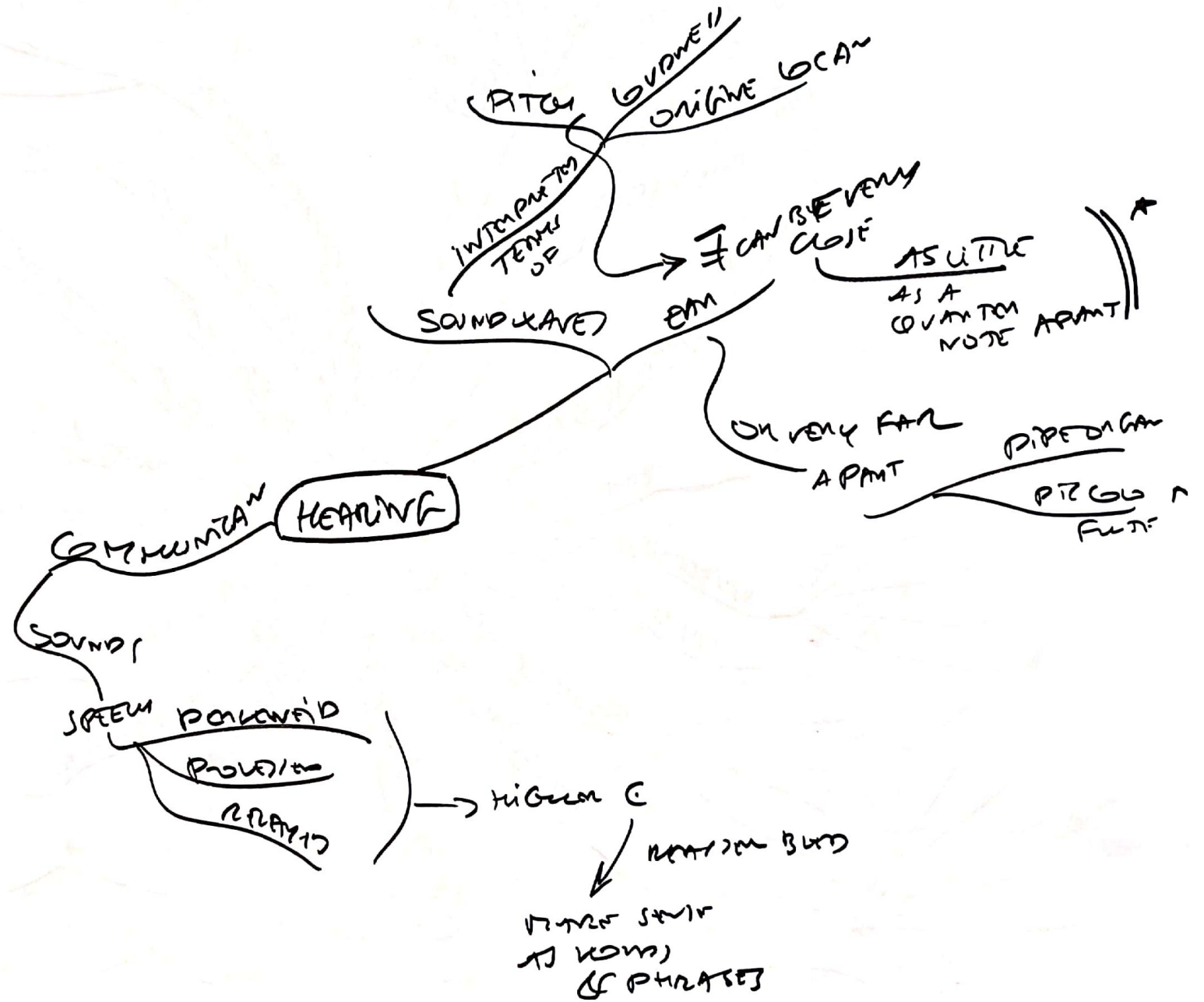
VES GCN  
AT  
PONT-MED  
JUNCN BS



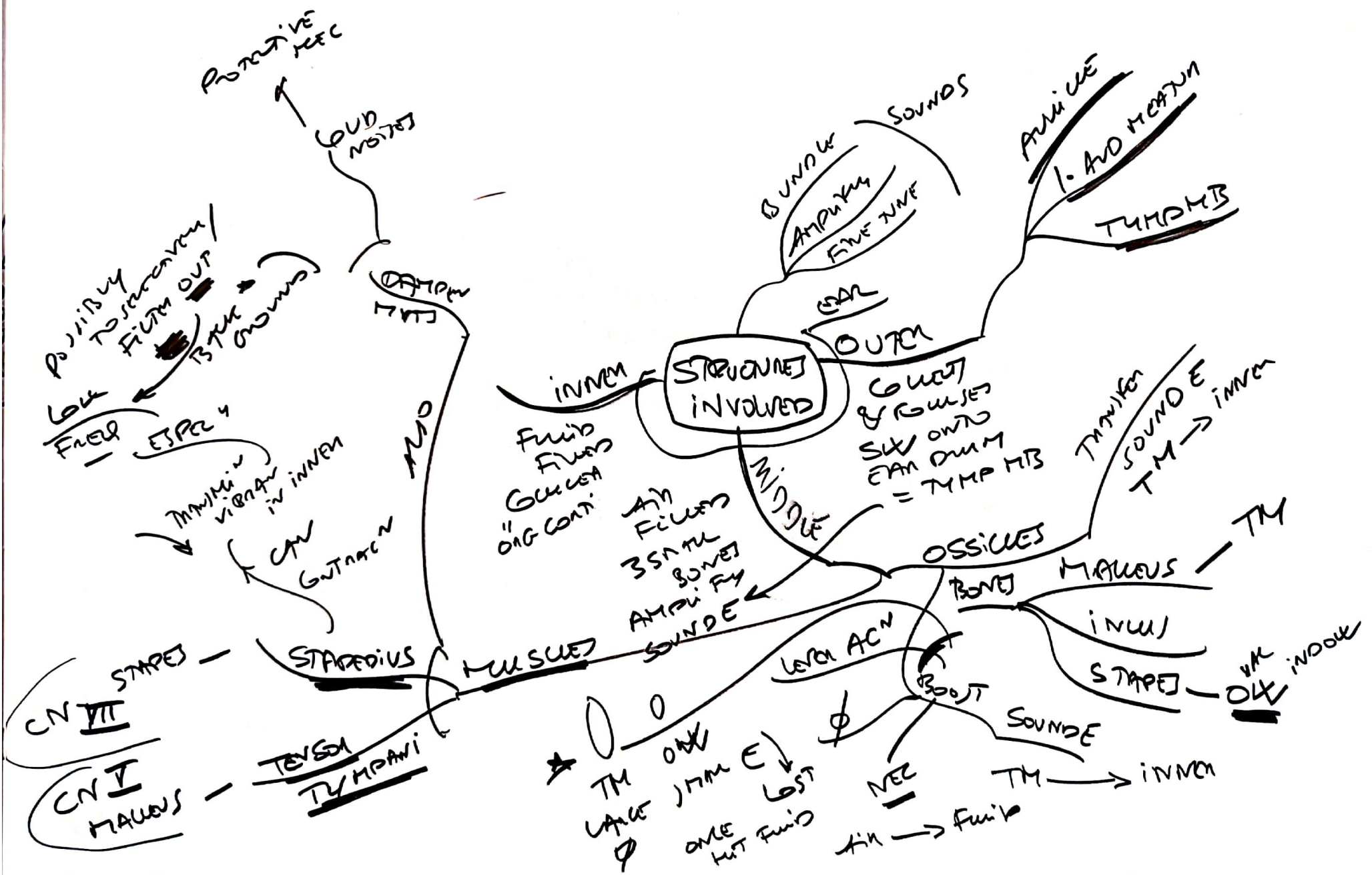


# HEARING

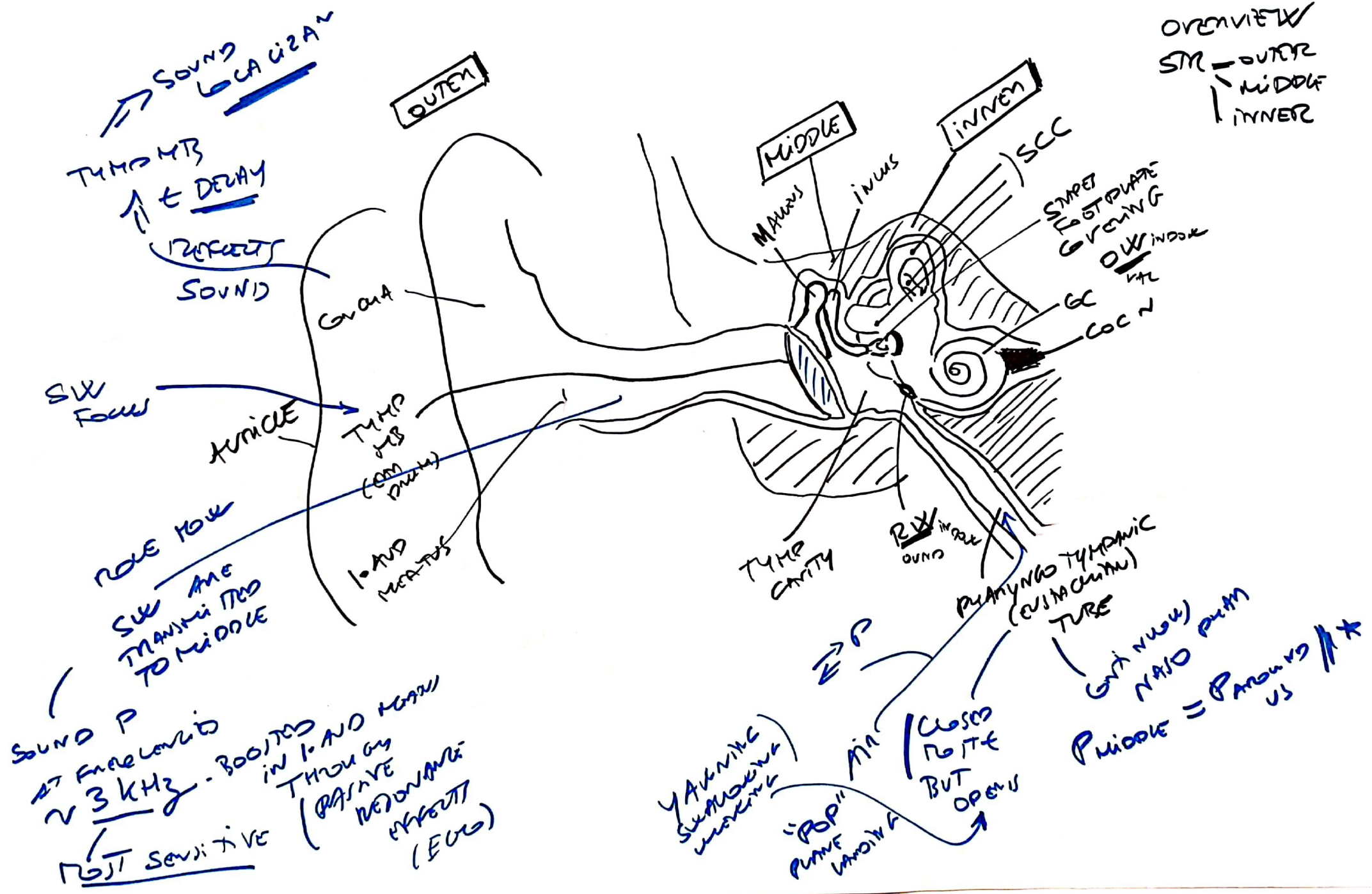


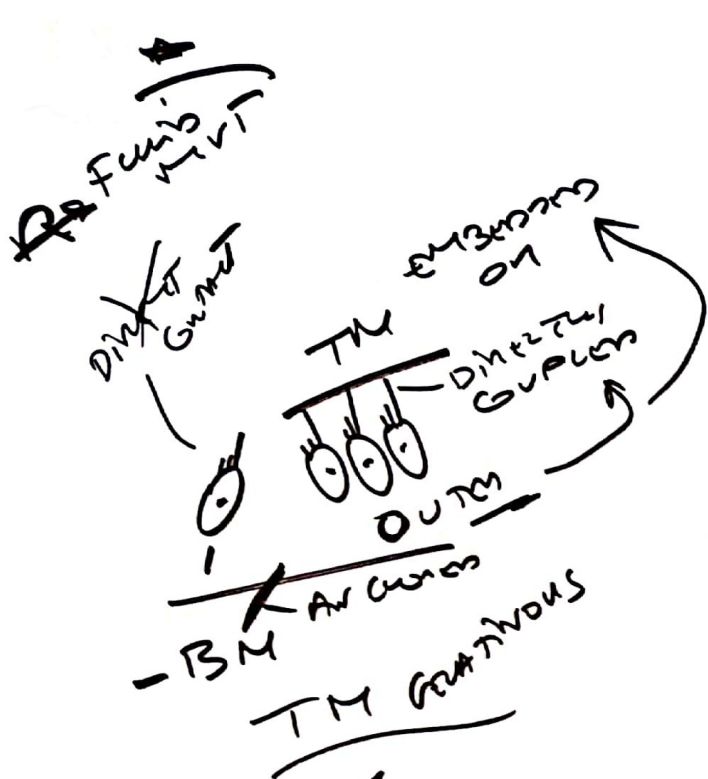






OVERVIEW  
STR - OUTER  
MIDDLE  
INNER

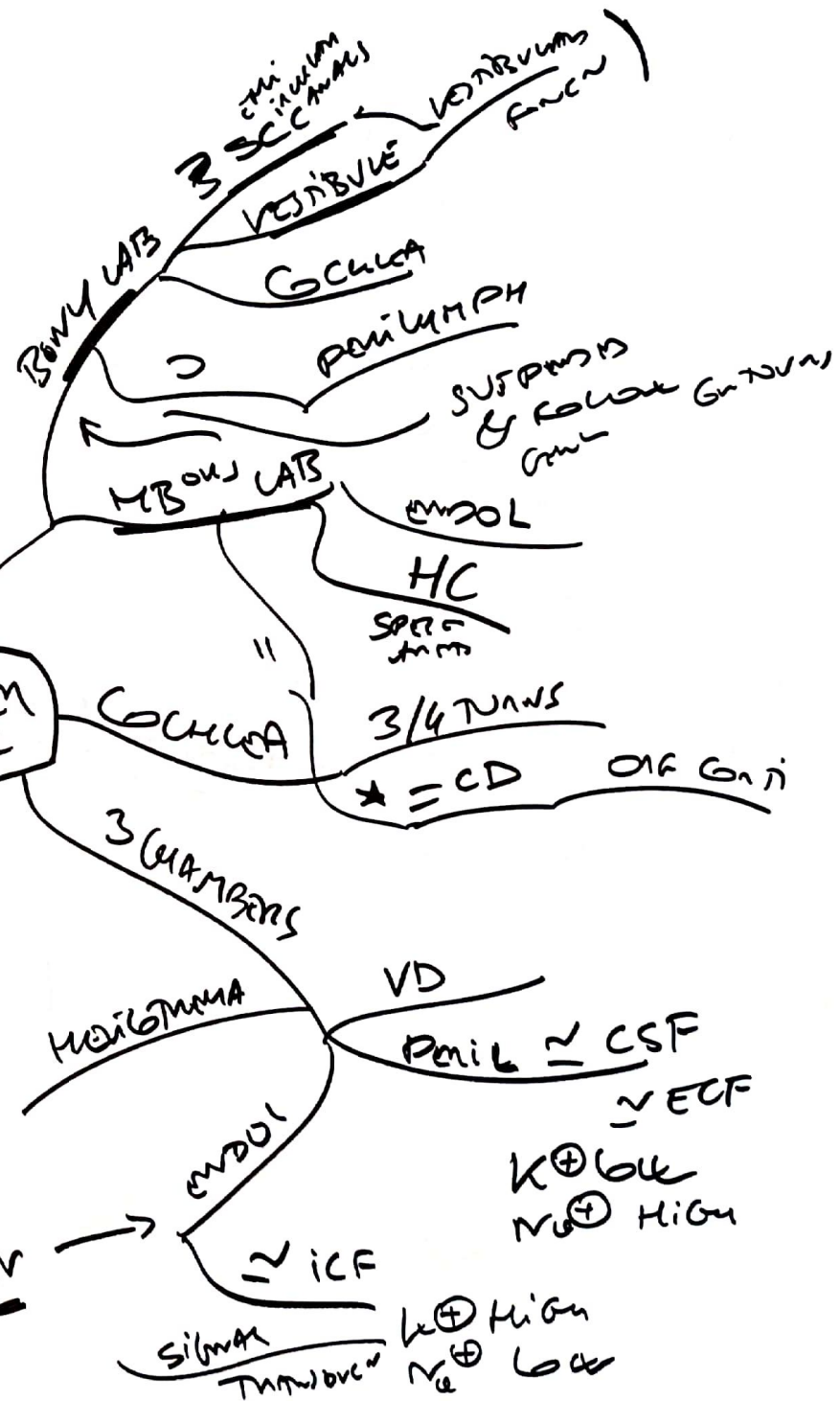




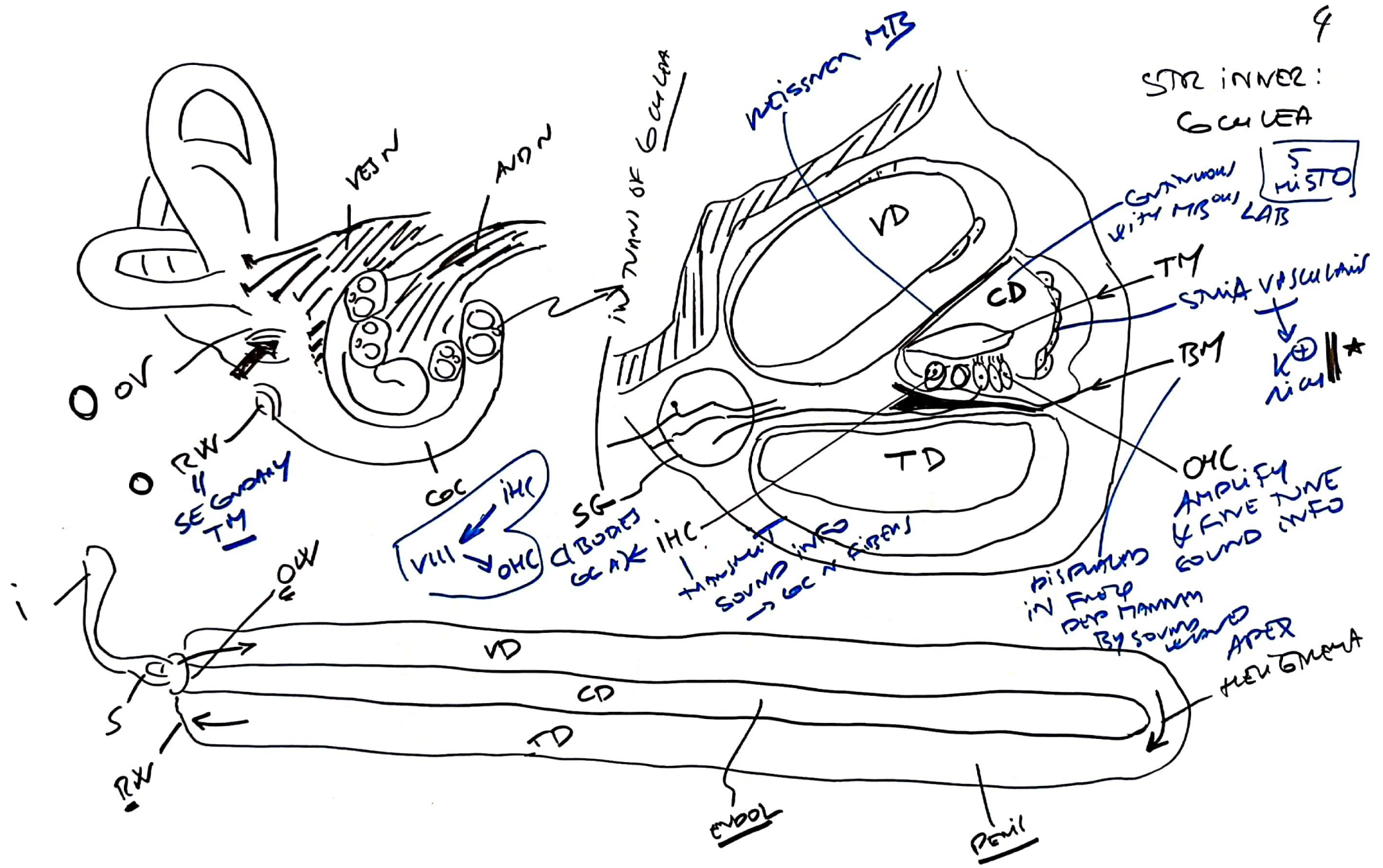
HC  
 SIGMA  
 THROUGH &

**ORGAN CORTI**  
 1 row IHC  
 3 rows OHC  
 + SUPPORTING

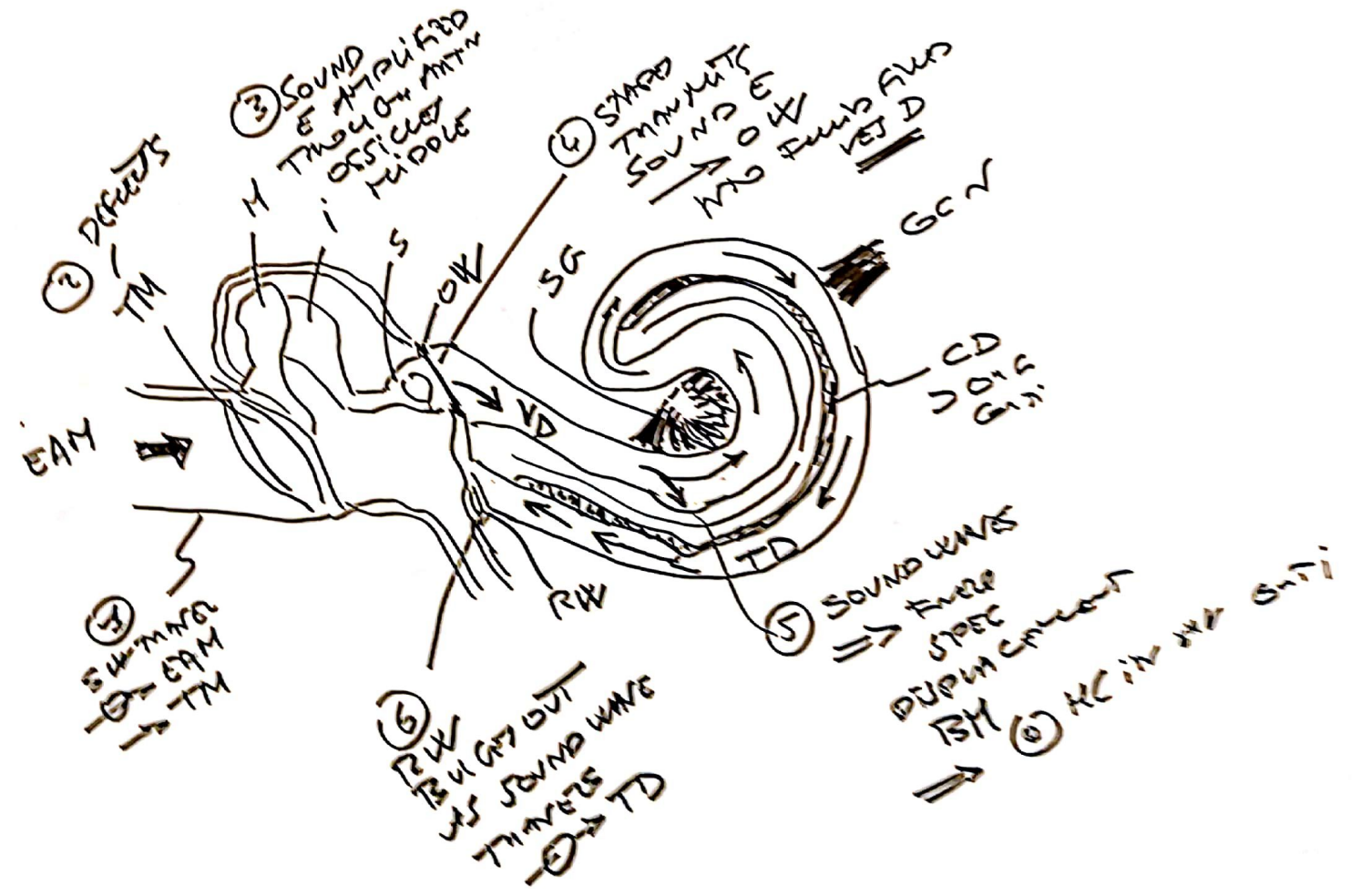
**INNER EAR**



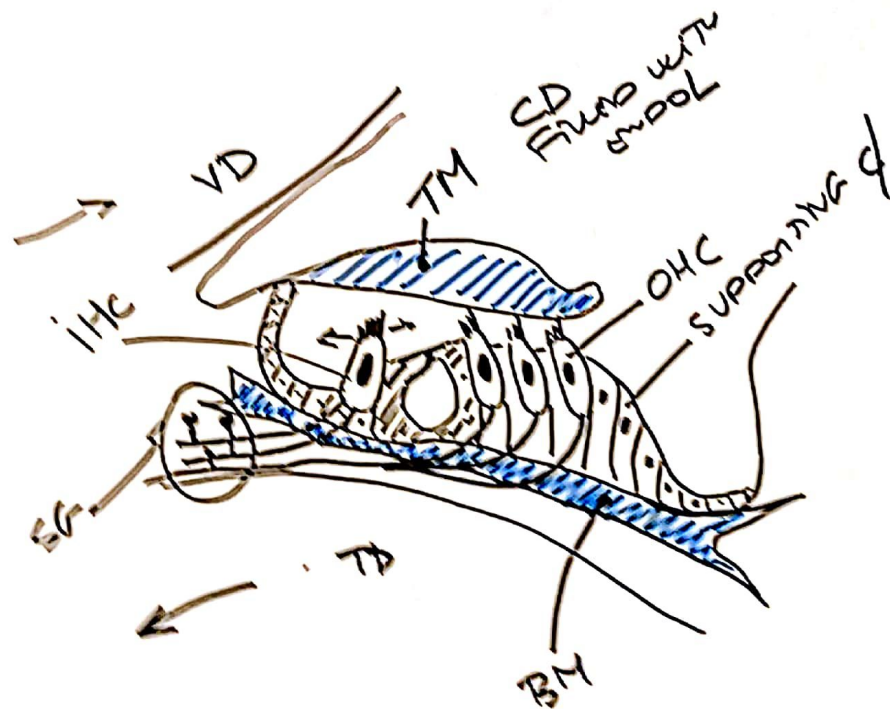




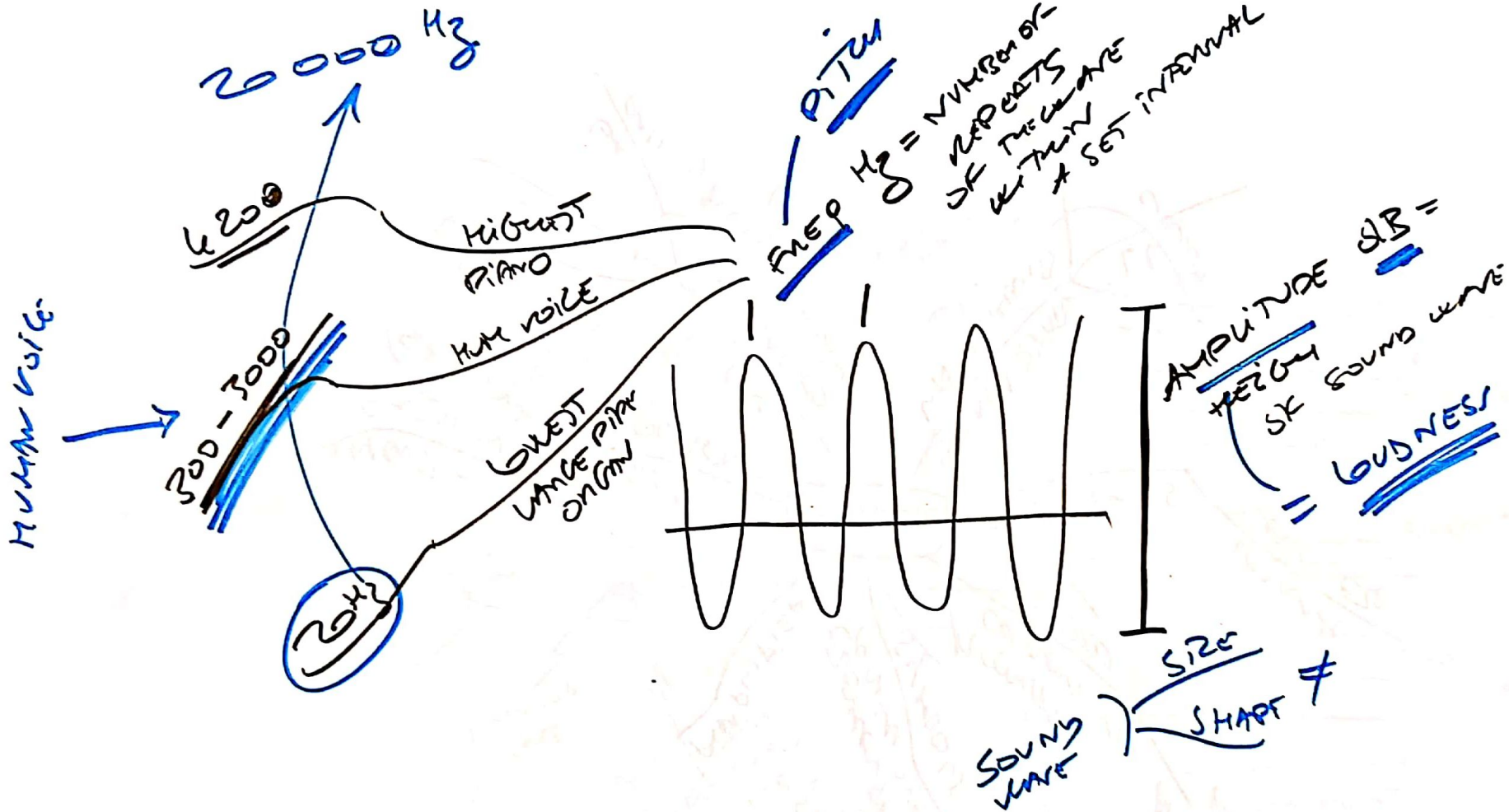
# SOUND TRANSDUCN IN EAR



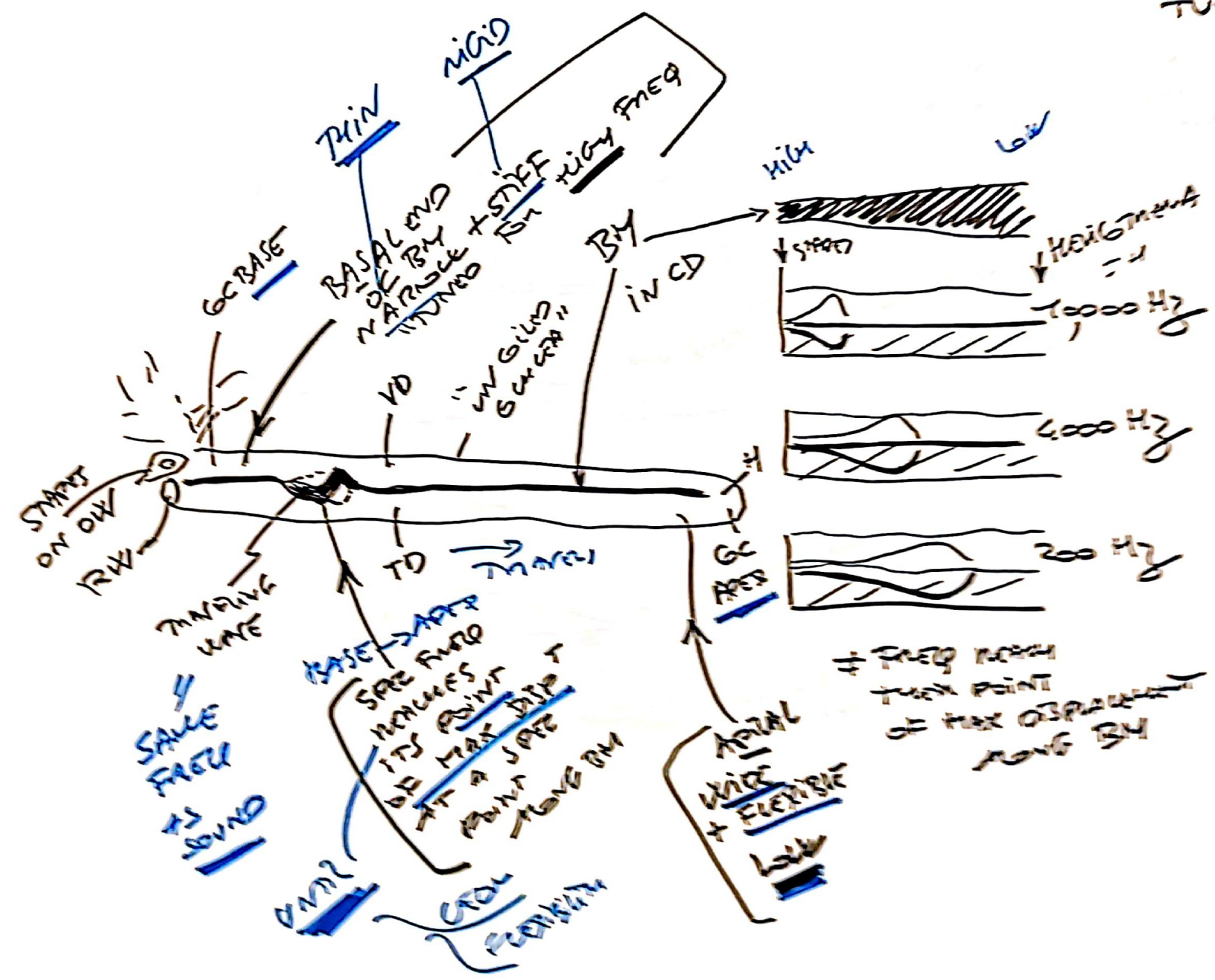
7  
ORGANE  
Corti



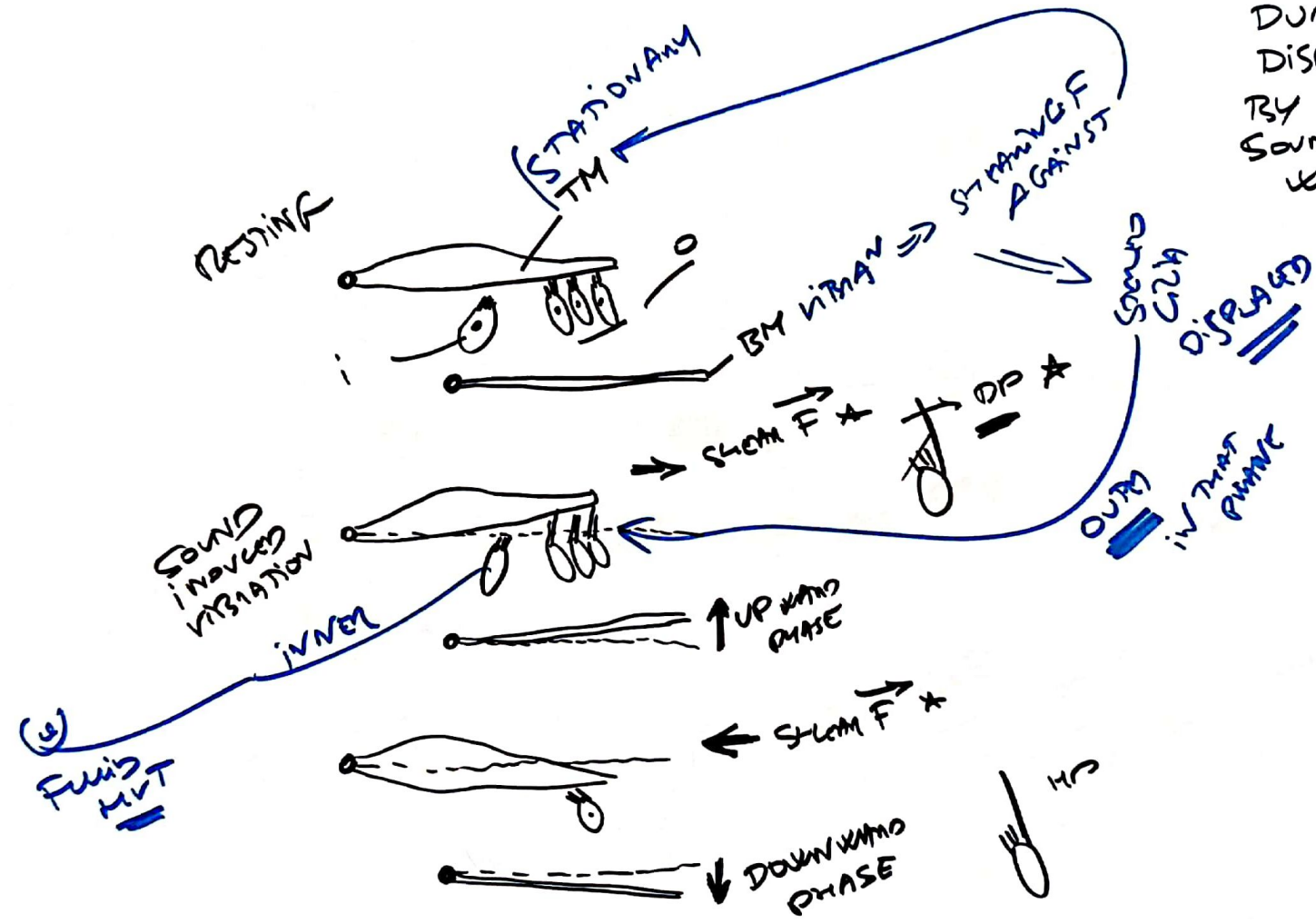




10  
 BASILAR  
 MEMBRANE  
 TUNING



OC DURING DISPLACEMENT BY SOUND WAVES

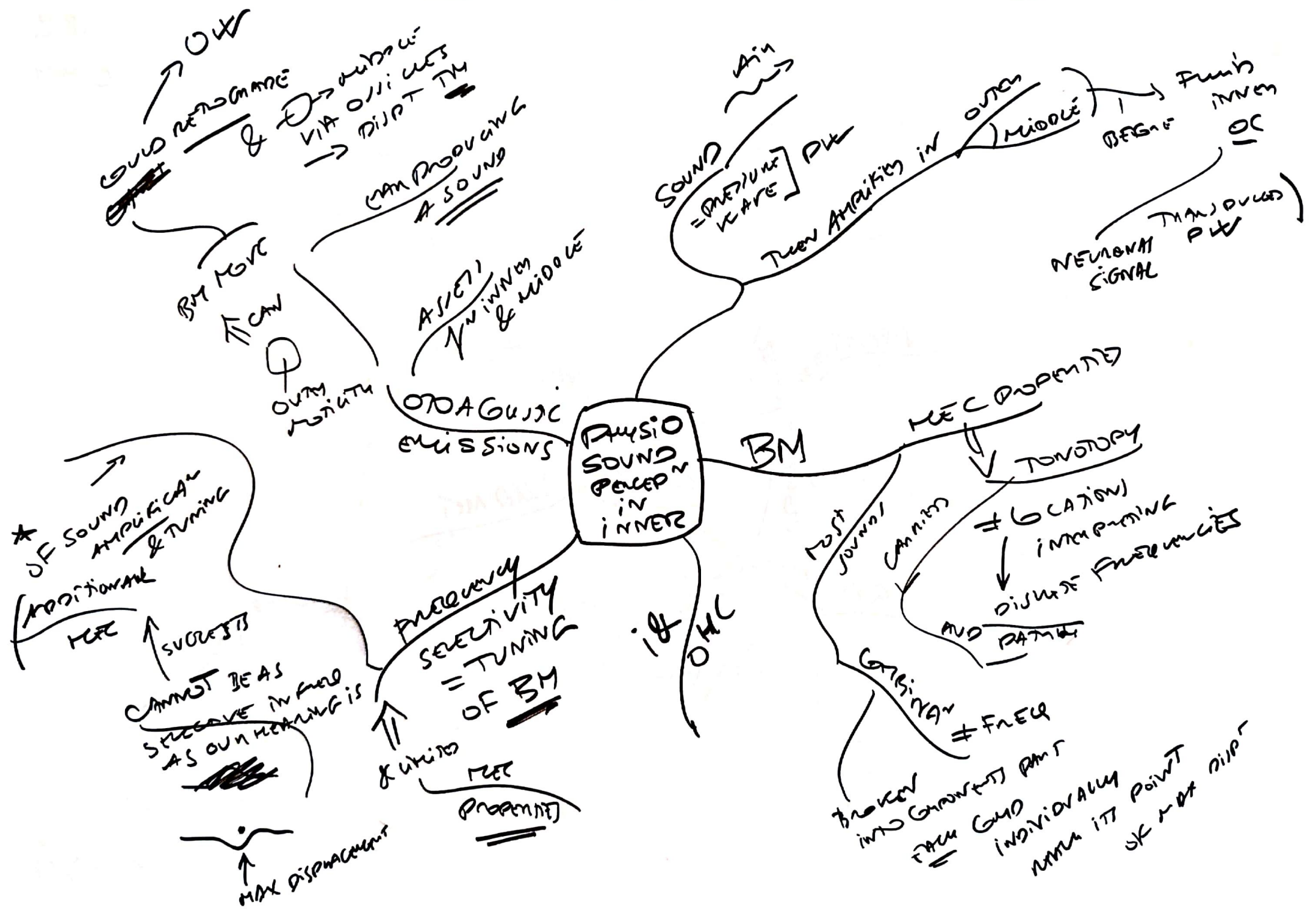




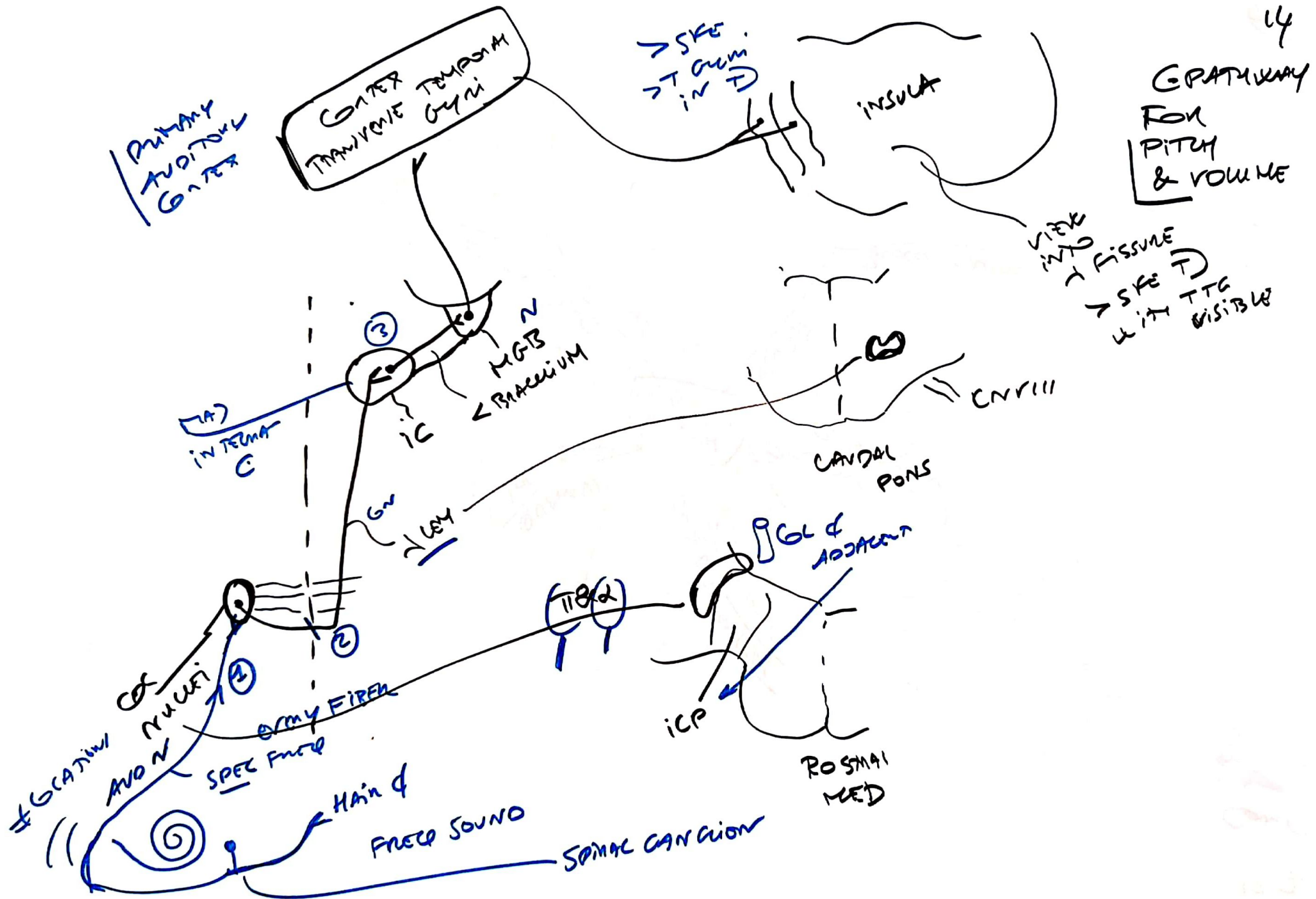




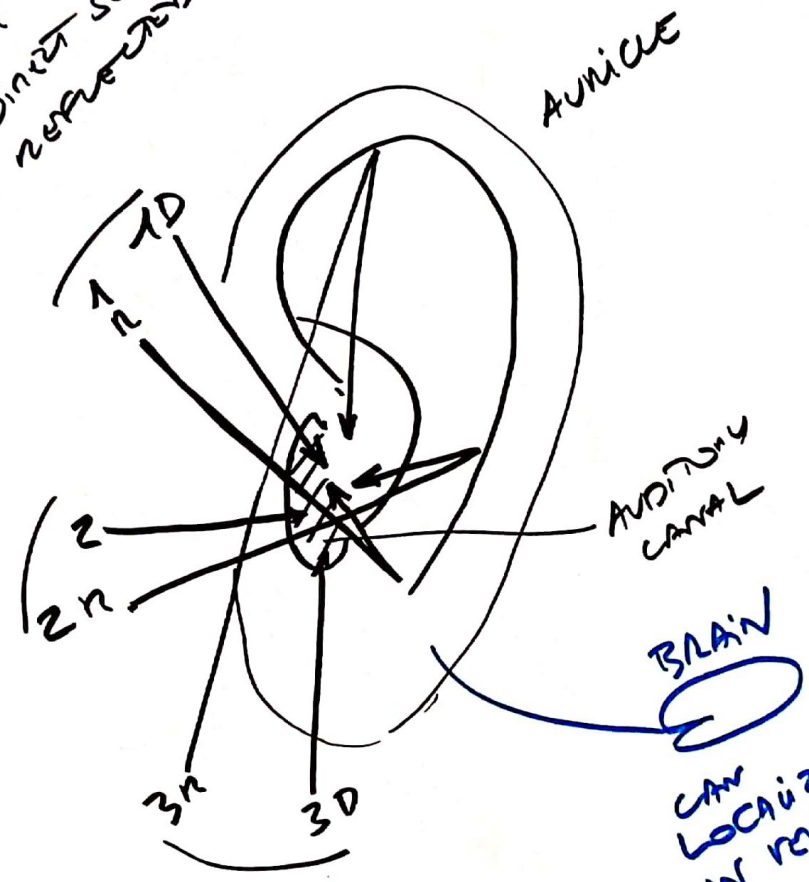








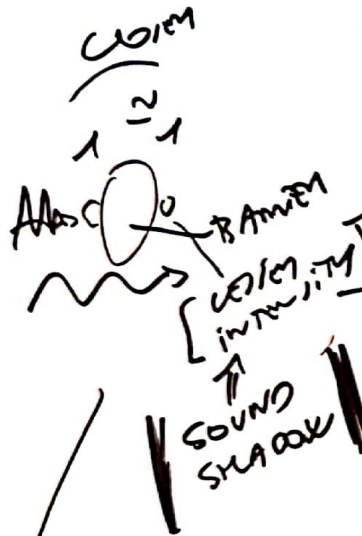
PATHS 1 2 3  
D = DIRECT SOUND  
R = REFLECTED



VENTRAL  
SOUND  
TRAPPING  
THROUGH  
REFLECTION  
OF SOUND  
IN OUTER EAR

BRAIN  
CAN  
LOCALIZE SOUNDS  
IN VENT PLANE  
THROUGH ANALYSIS  
OF  $\neq$  PHASE  
SOUND  
INPUTS  
BUT NOT FULLY UNDERSTOOD

↳ difference in detection & analysis



SOUND LOCALIZATION

INT - HIGH

CONVERGENCE

↳ DIVE AT LOW

CENTRAL AUDITORY PATHWAYS

PITCH & VOLUME

COLEMS

ANAL & ASPECT

FREQUENCY PITCH

AMPLITUDE VOL

LOCATION

TEMPERATURE

LOW

HIGH

FIELD

MAVER

GY

↳ SURMOUNT FORWARDS

HIGH

LOW

PLUMED

VERTICAL



ONLY ONE EAR

HORIZONTAL

L/R

→ BOTH

HORIZONTAL SPATIAL MAPPING

VERTICAL SOUND MAPPING





TEST  
 WAXEN  
 TUNING  
 FORK  
 ON VERTEX  
 SKULL



CONDUCTIVE → 2 MAIN CATEGORIES → SENSORINEURAL | DIAGNOSING HEARING LOSS



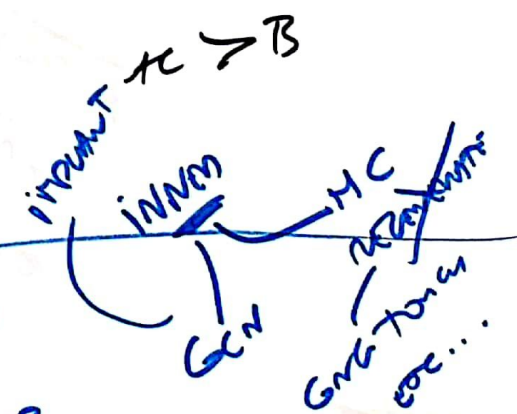
RINNE  
 in FRONT OF EAR & CONDUIT in  
 MASTOID BONE

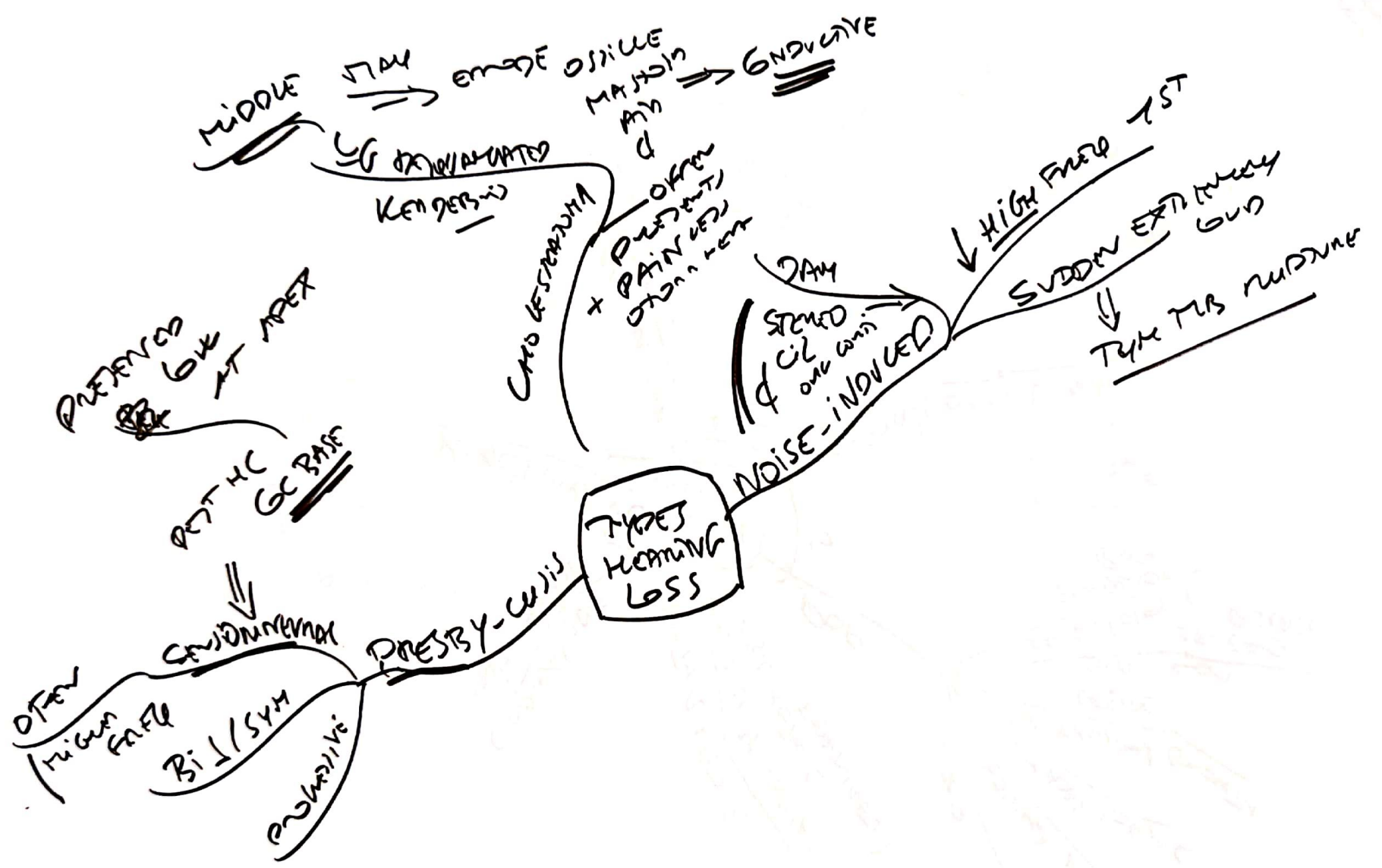


BC > AC

HEARING AID

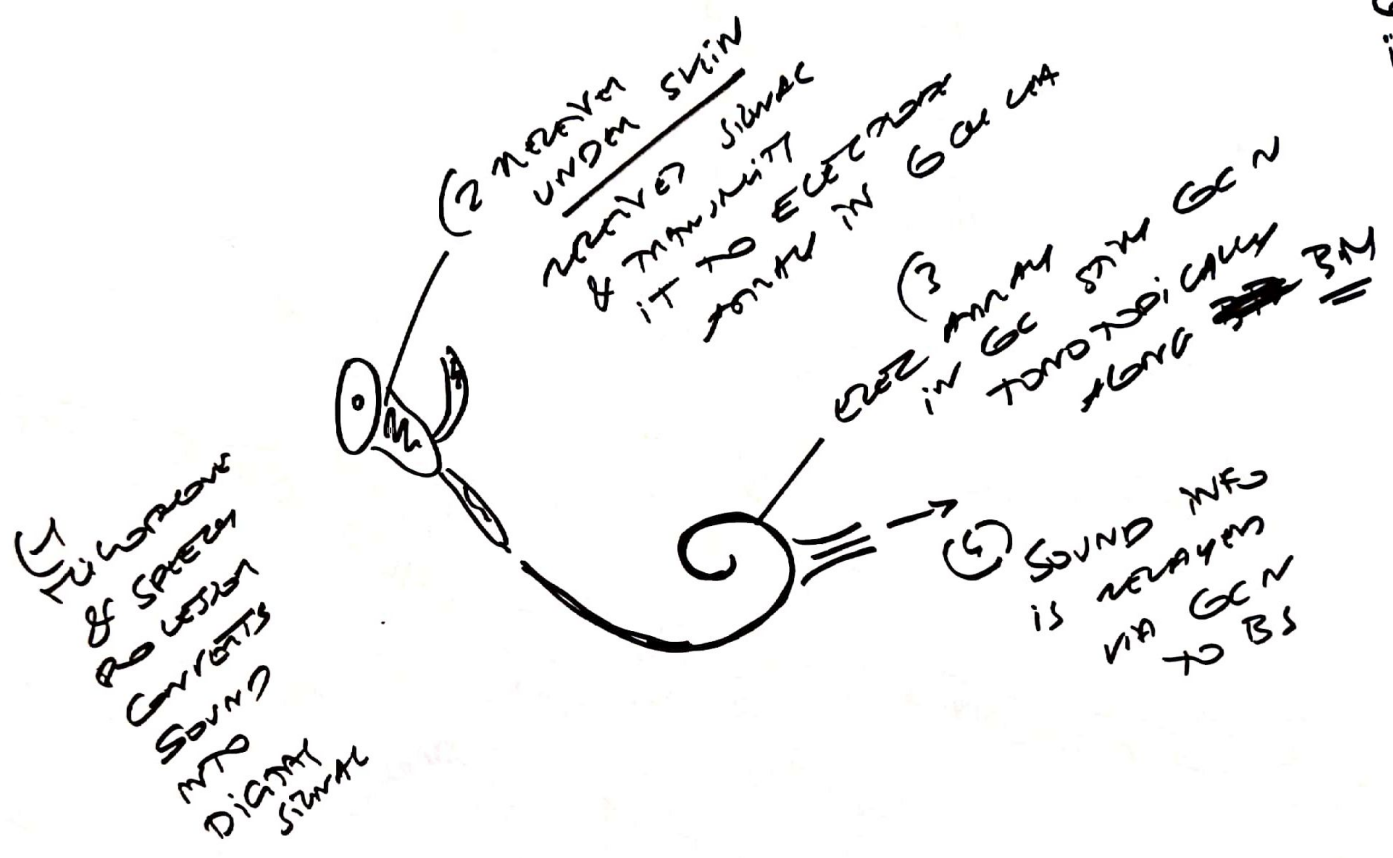
MIDNAP TM OBS TWEEN OUTER INNER  
 MID BUILDERS FUMS ON ANTIMI'S OSSICLES





LE

COULOMB  
IMPLANT







SOUND SOURCE



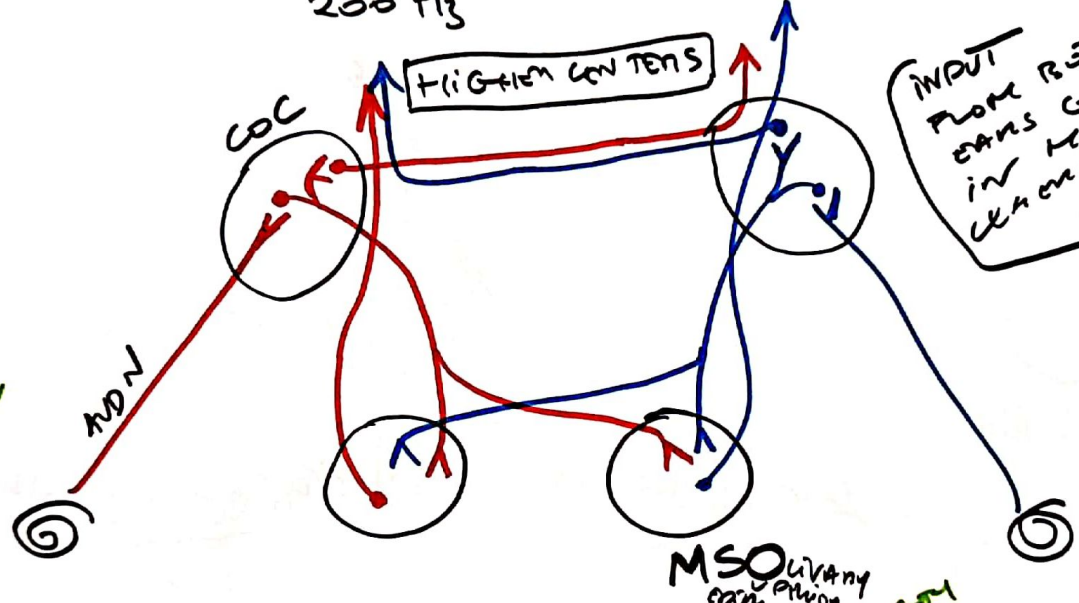
200 Hz



SOUND WAVES REACH EAR CLOSE TO S 1ST EAR FASTER WITH DELAY

16 DIFF DETECTION AT LOW FREQ

TEMP SUMMATION FROM L & R EAR WITH DELAY & FROM L & R EAR WITH DELAY



INPUT FROM BOTH EARS CONVERGE IN MSO WITH DELAY IN SIGNAL IS ANALYZED BELOW 3 kHz

ONLY LOW FREQ WITH DELAY WILL BE INTERESTING

ONLY LOW FREQ WITH DELAY WILL BE INTERESTING

1 SOUND WAVES AT EAR CLOSE TO S 1ST

2 AP TRAVEL TO COC NE REAR & FROM TO CONTRA MSO

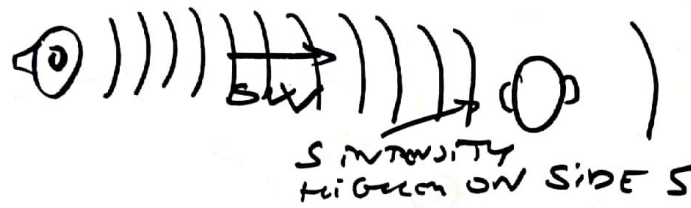
6 ON WITH BOTH PATHS CONVERGE IN D<sup>n</sup> ACT AS A COINCIDENCE DETECTOR MSO

MSO (VARY EAR) IN LOW FREQ LOW FREQ SENSITIVE

3 LATER

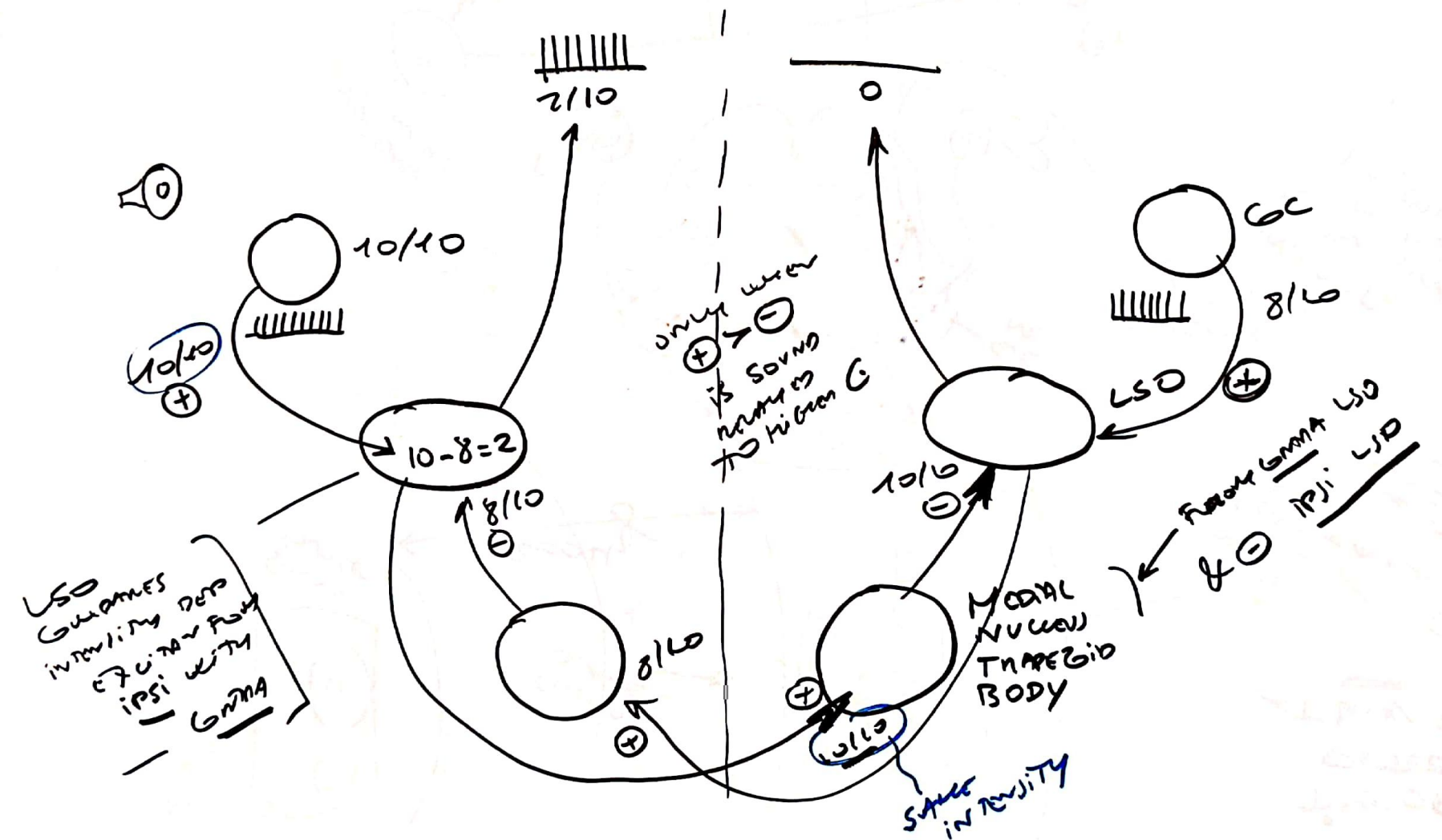
5 PATH W FROM CONTRA IS LOW FREQ IPSI SLOWER

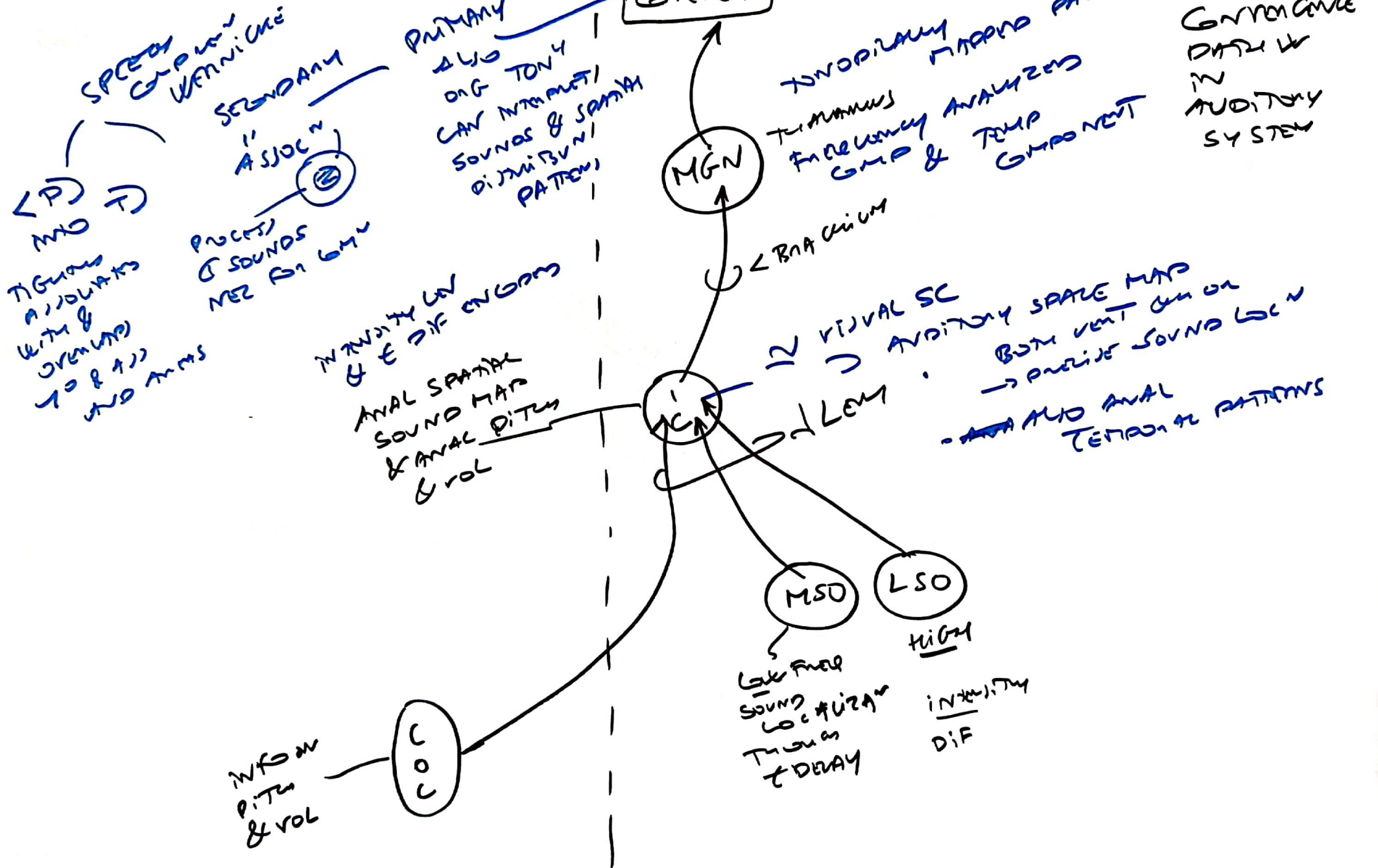
4 BOTH TRAVEL AT SAME SPEED & THEY CONVERGE IN MSO



SHADOW  
- LESIONS INTENSITY ON THE SIDE AWAY FROM S

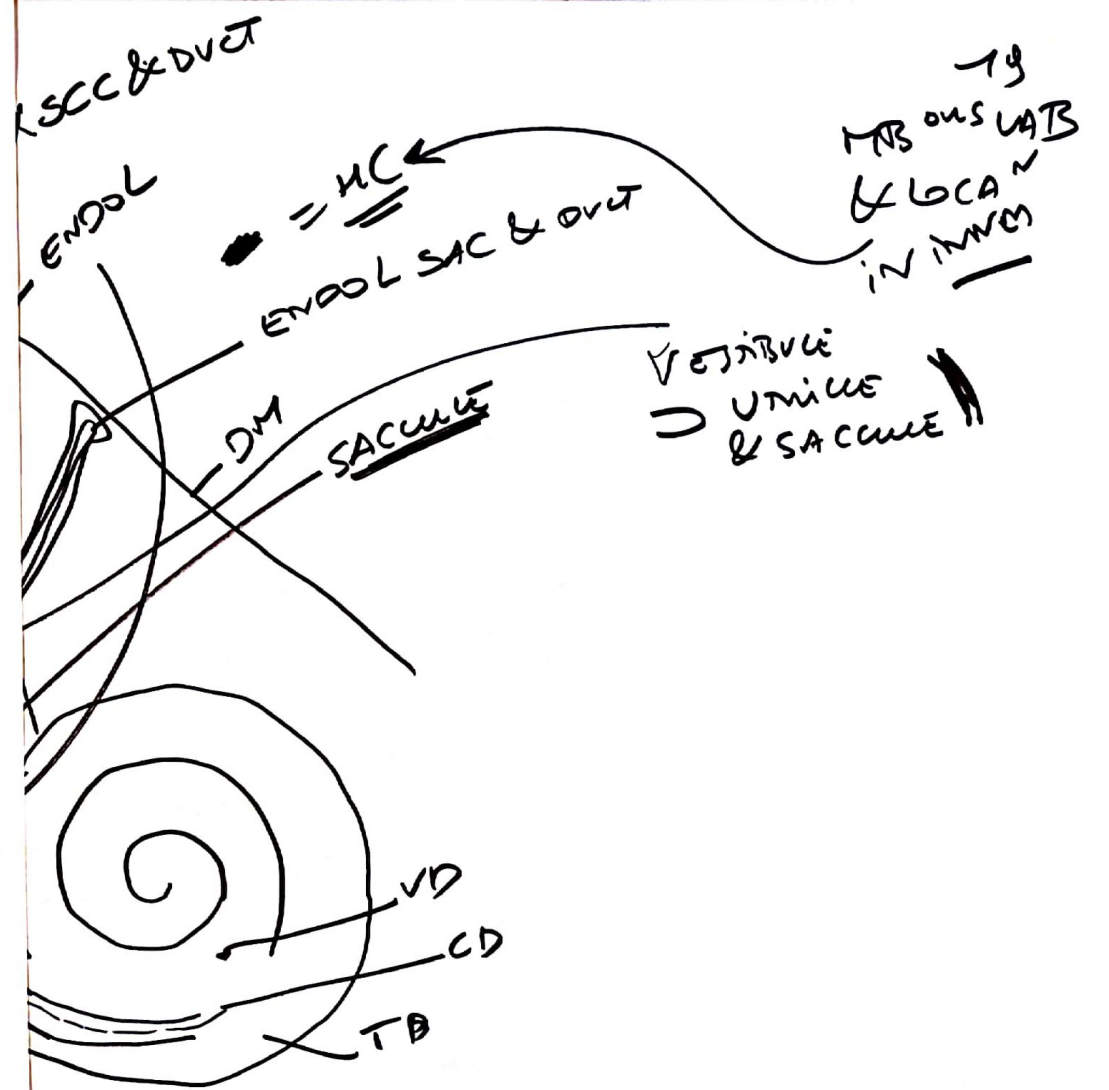
INTENSITY DIF  
DETECTION SOUND  
AT HIGH  
3000





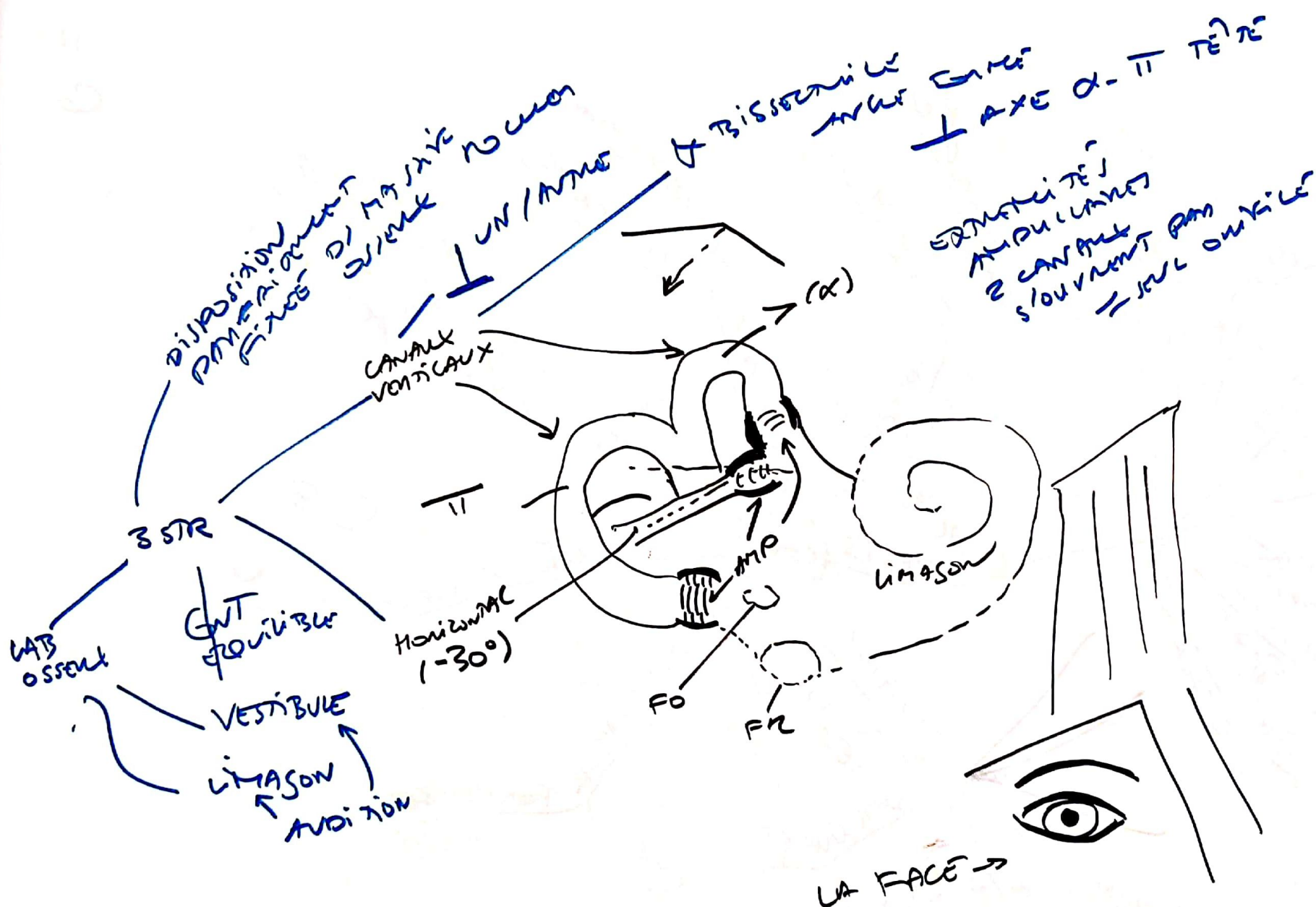


BAUANCE





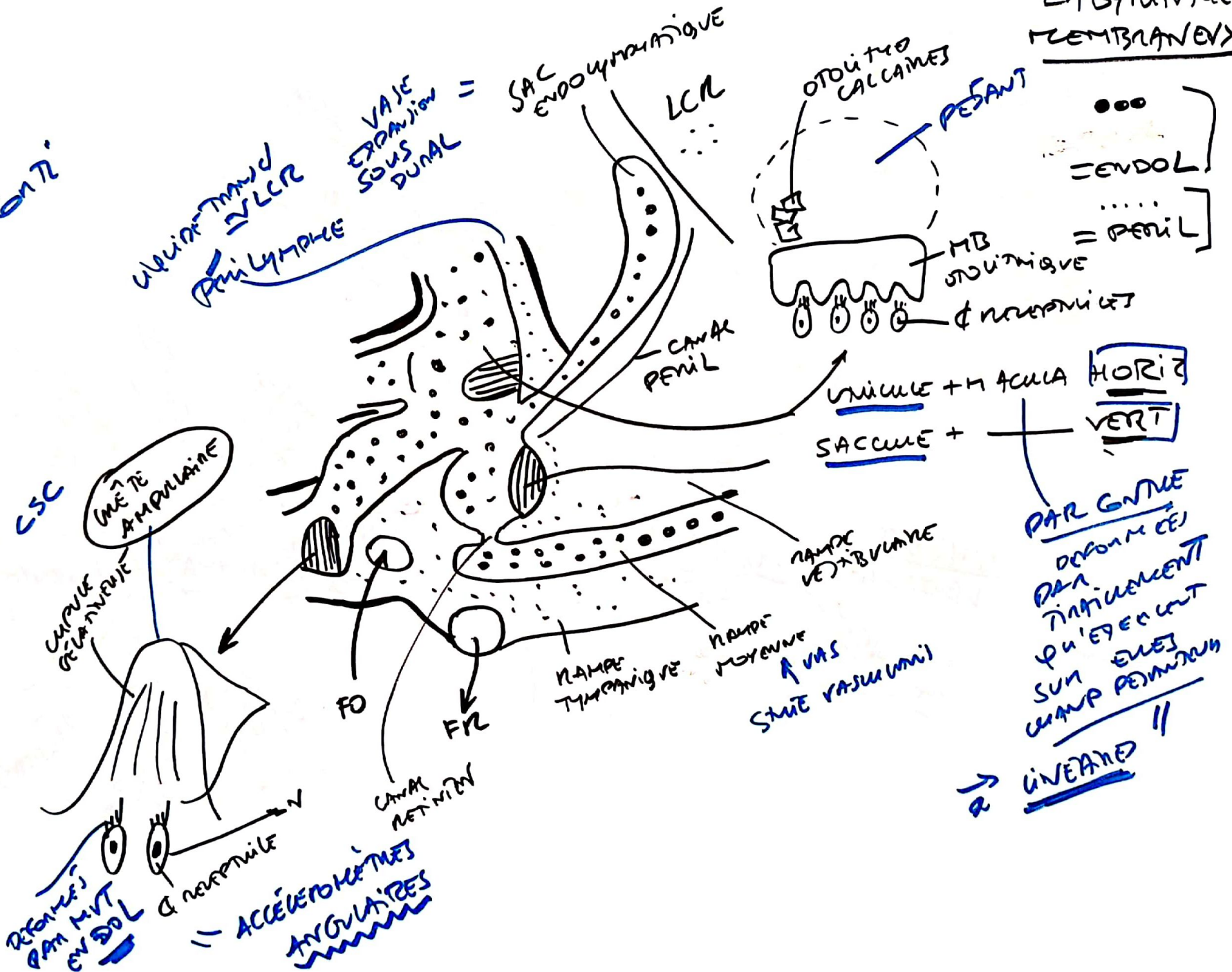
# LABYRINTHE OSSEUX

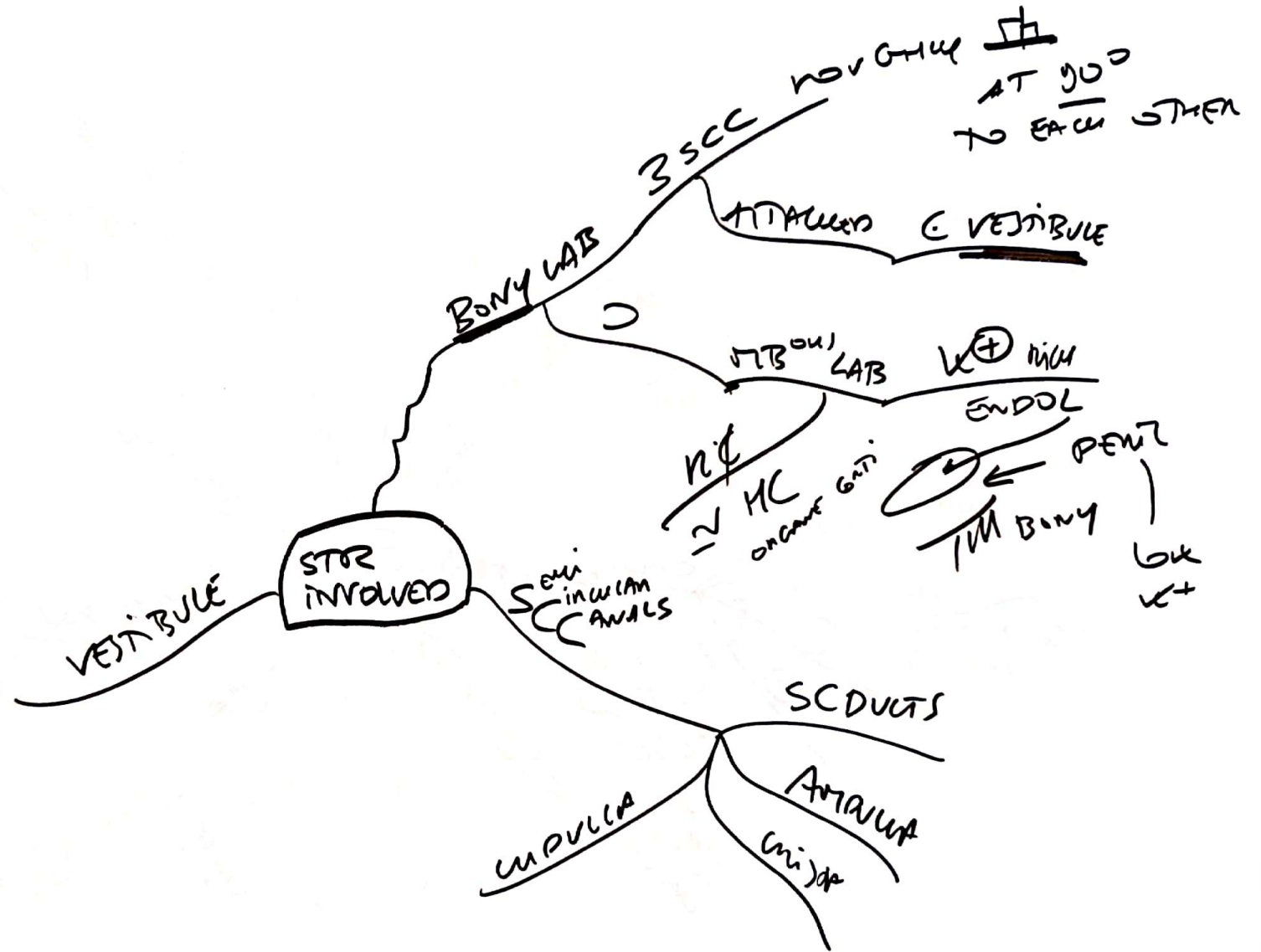


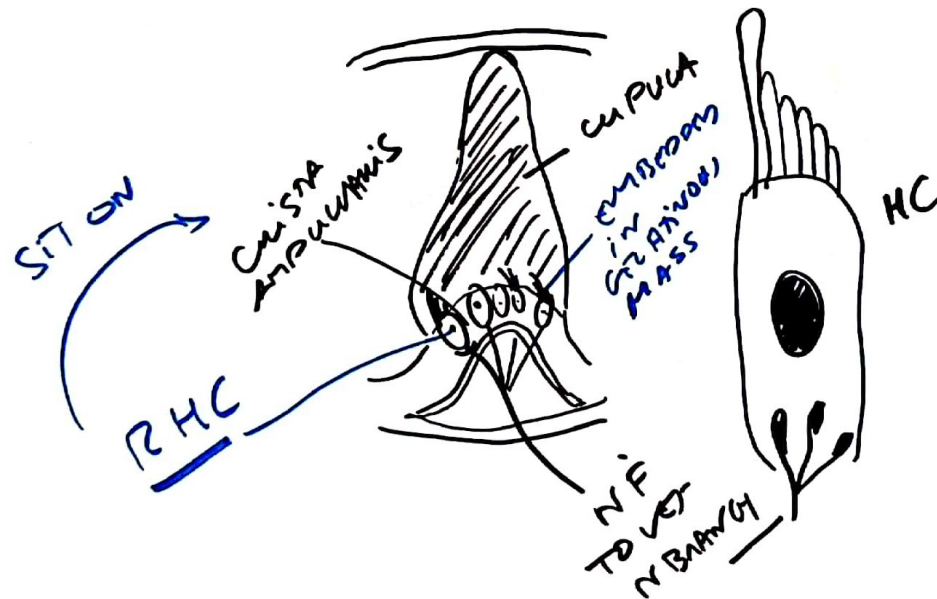
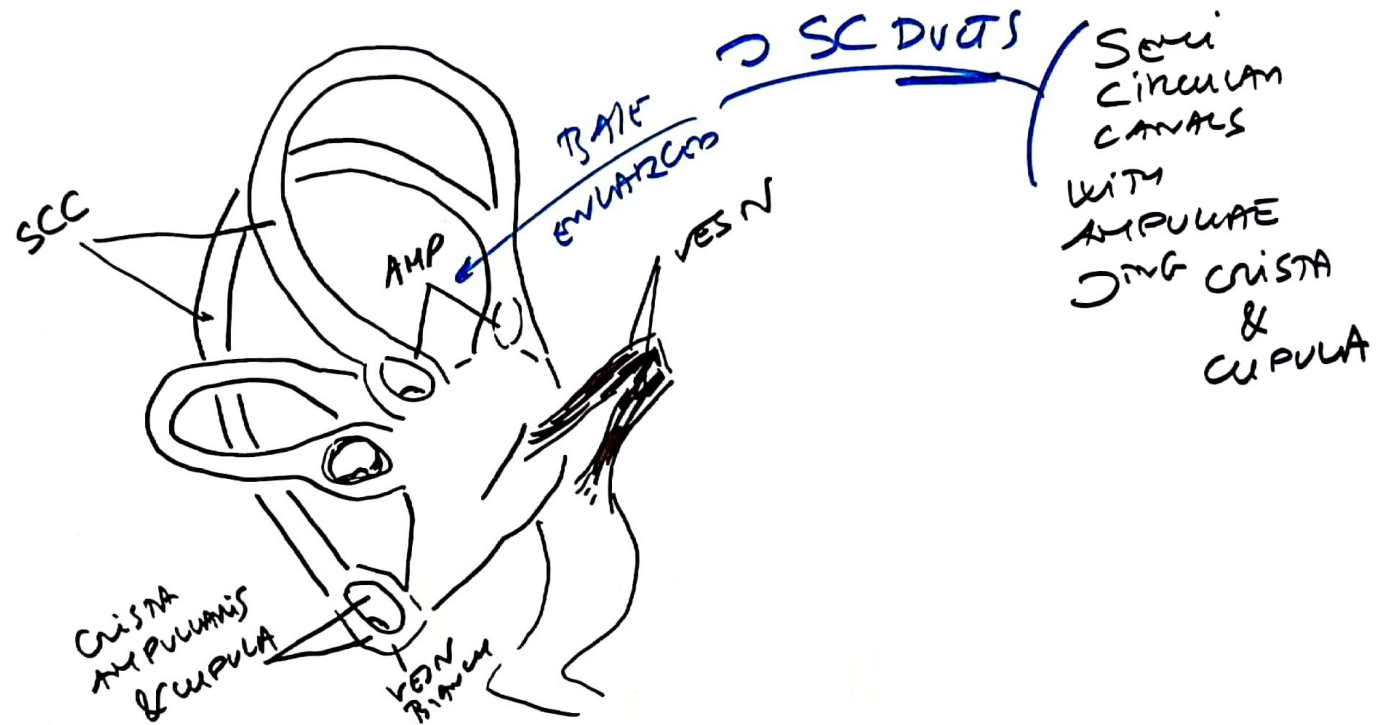


3 CRÊTES  
+  
2 FACILTA  
+  
1 ORCANE ENTÉ

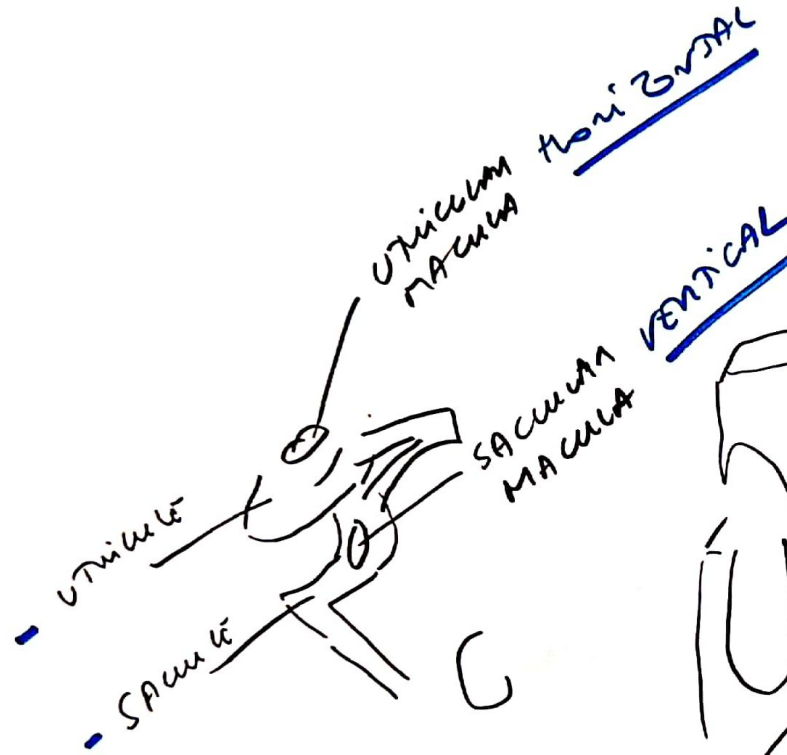
LABYRINTHE MEMBRANEUX









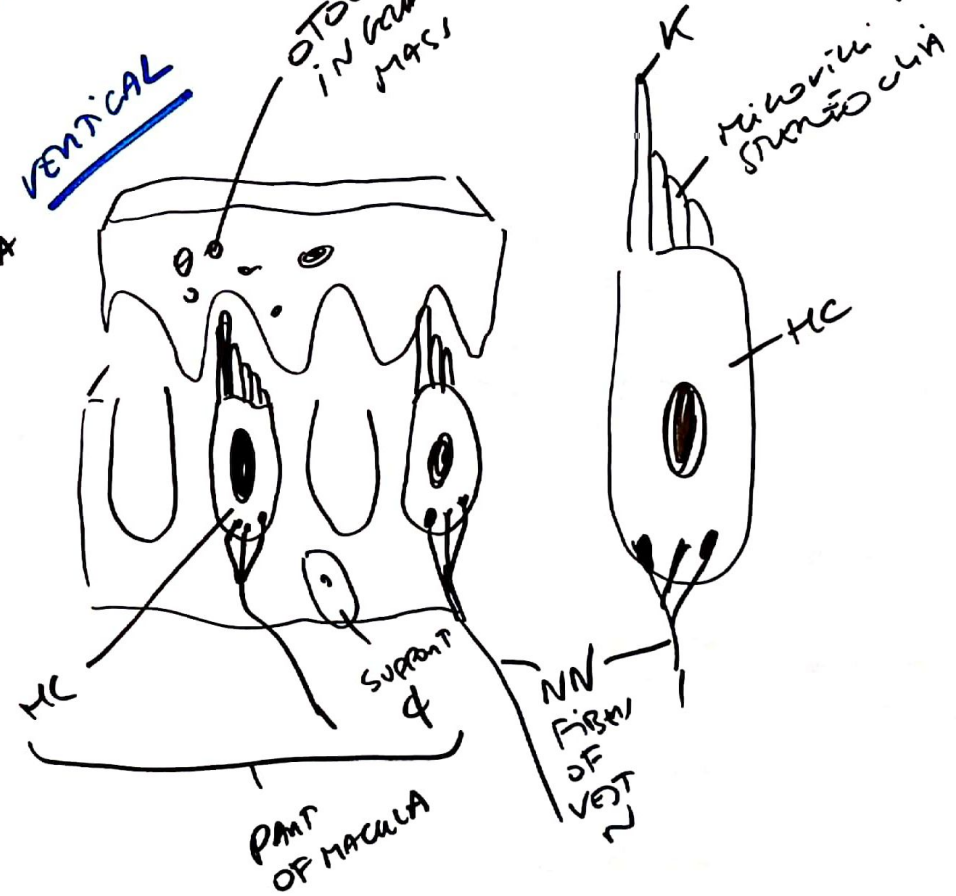


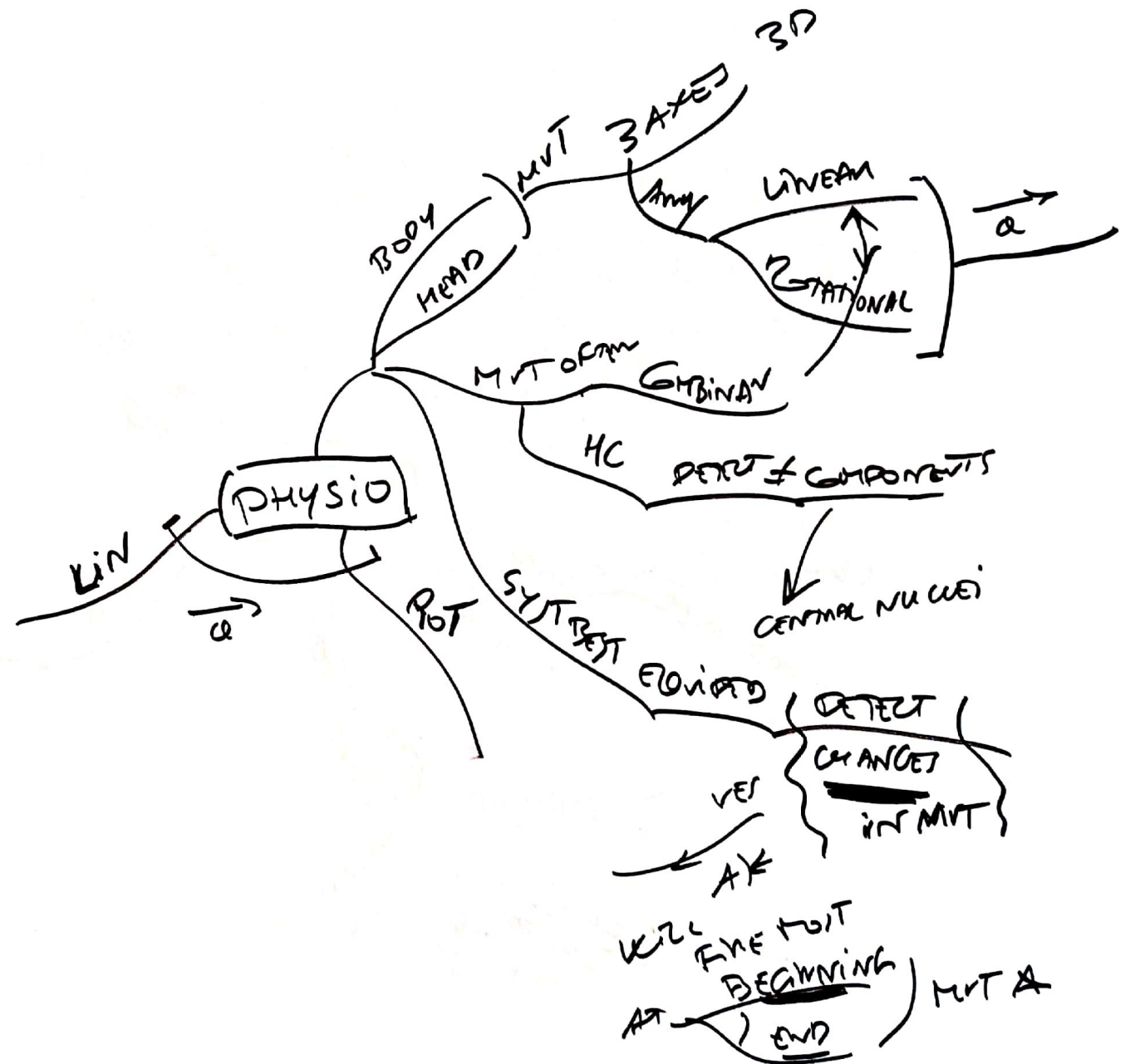
CO CARBONATE  
BY SAC

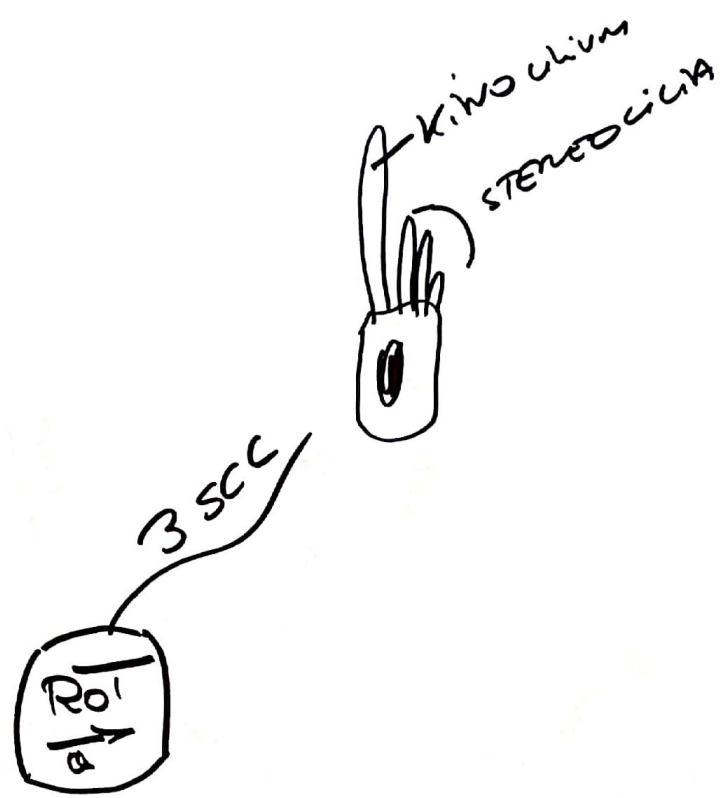
OXYGENA  
OTOLITHS  
IN GELATINOUS  
MASS

21  
OTOLITHIC  
ORGANS:

UTRICLE &  
SACCULE

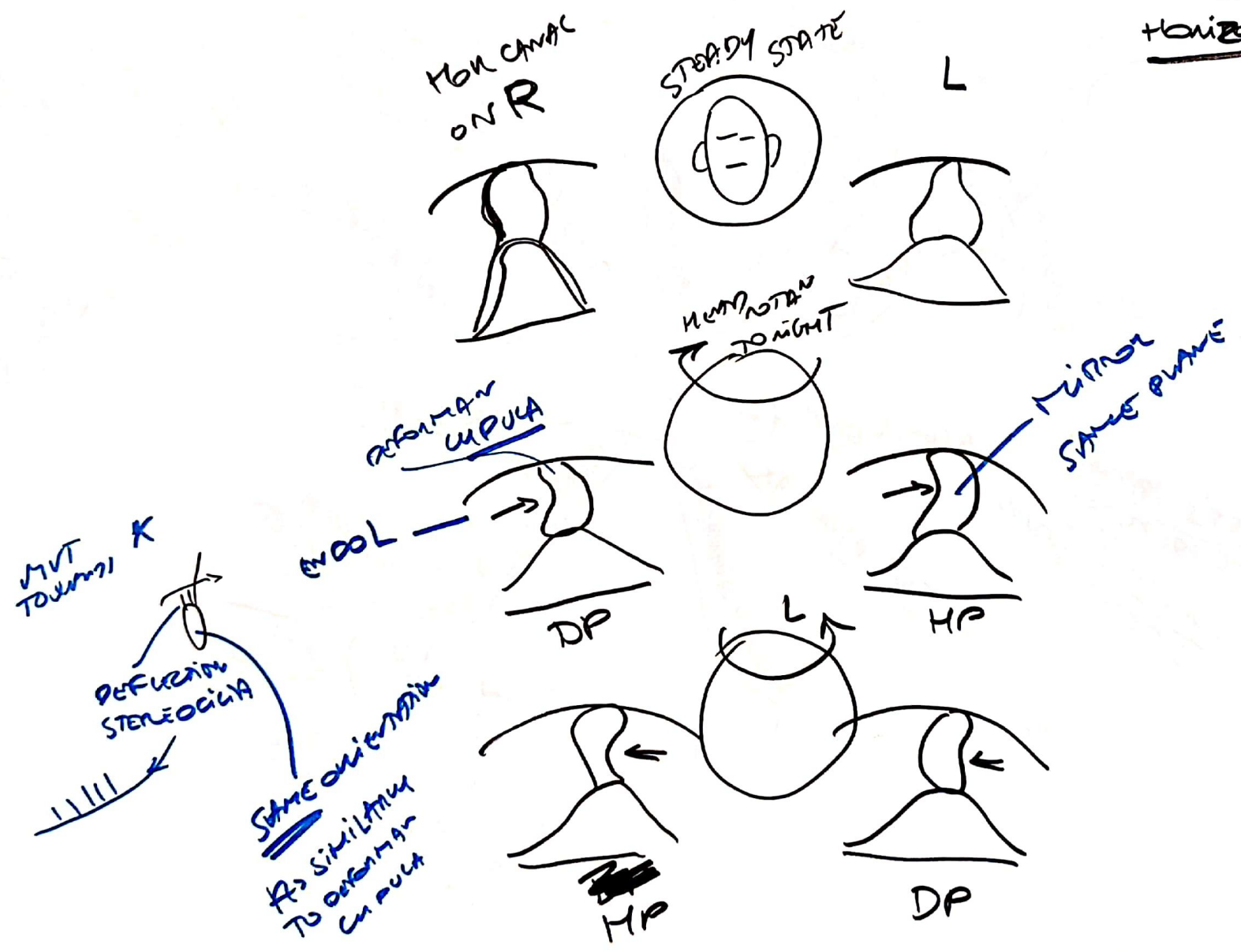


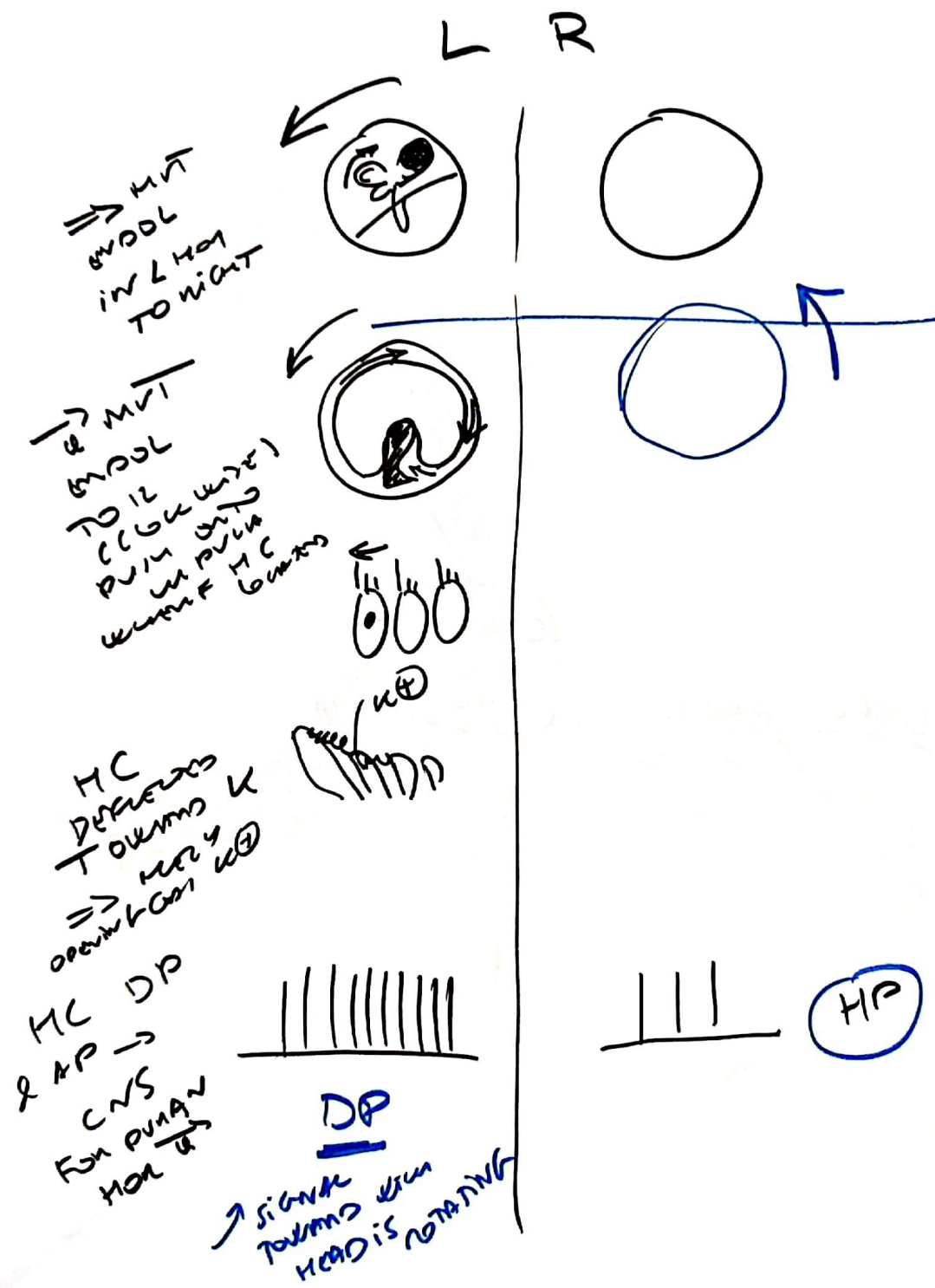






ROTATIONAL  $\alpha$   
& DEFLECTION  
CUPULA IN  
HORIZONTAL SCC





⇒ MUT  
SIGNAL  
IN L HON  
TO HON

⇒ MUT  
SIGNAL  
TO IC  
(CLOCK WIRE)  
PULL UP  
MUT  
MUT  
MUT

MC  
DEFINITION  
TOLIMMS  
⇒ MUT  
MUT

MC DP  
R AP →  
CNS  
FOR PUNAN  
HON

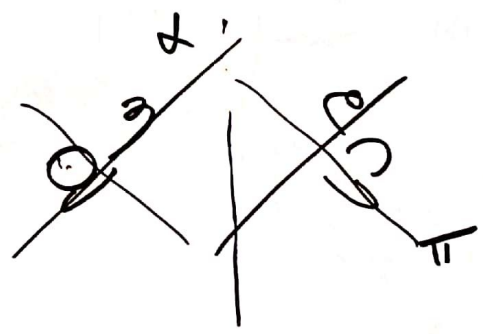
DP  
→ SIGNAL  
TOLIMMS  
HEAD IS ROTATING

23  
HOW ROT AL

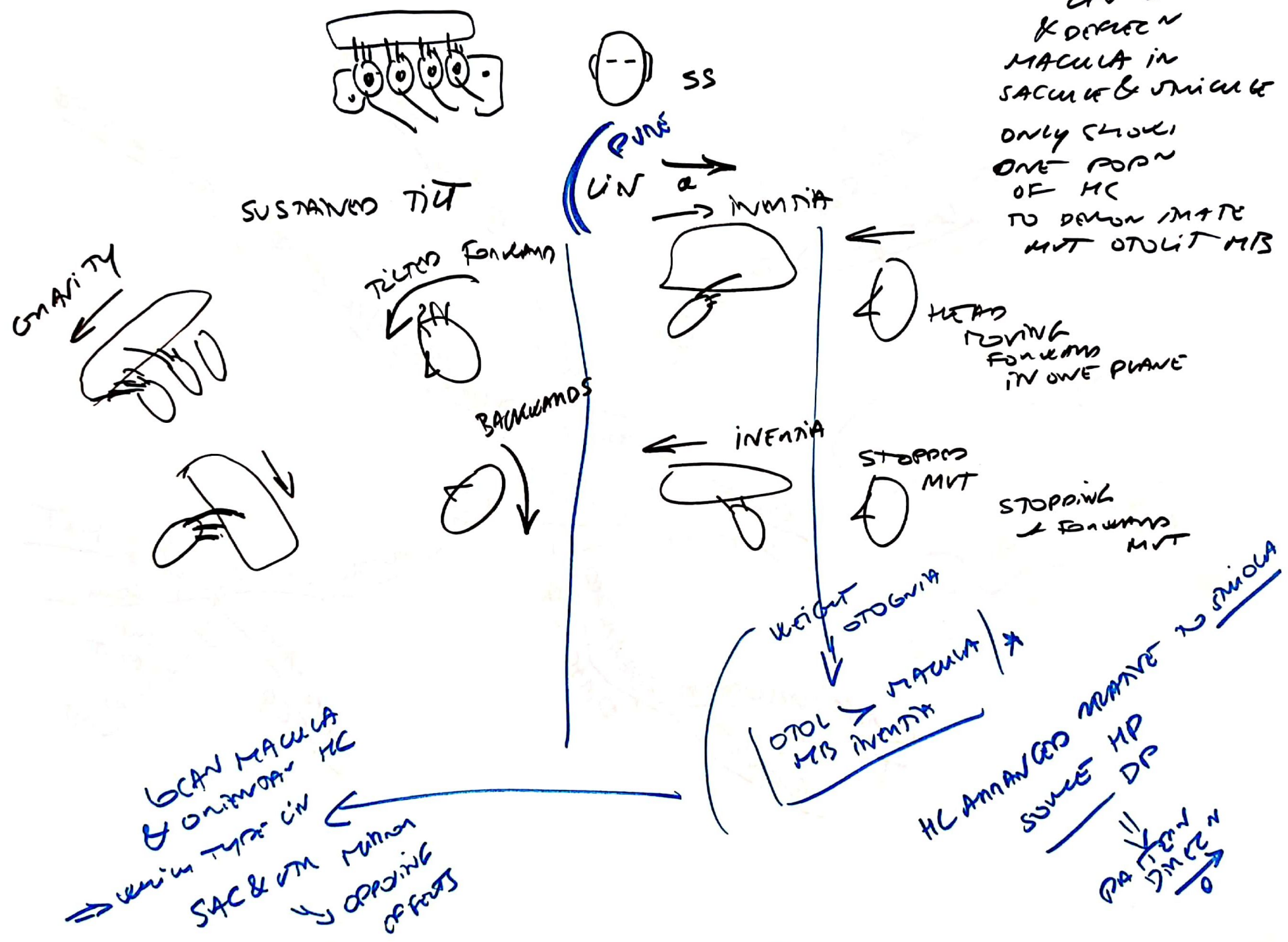
→ SIGNAL  
TRANSDUCTION

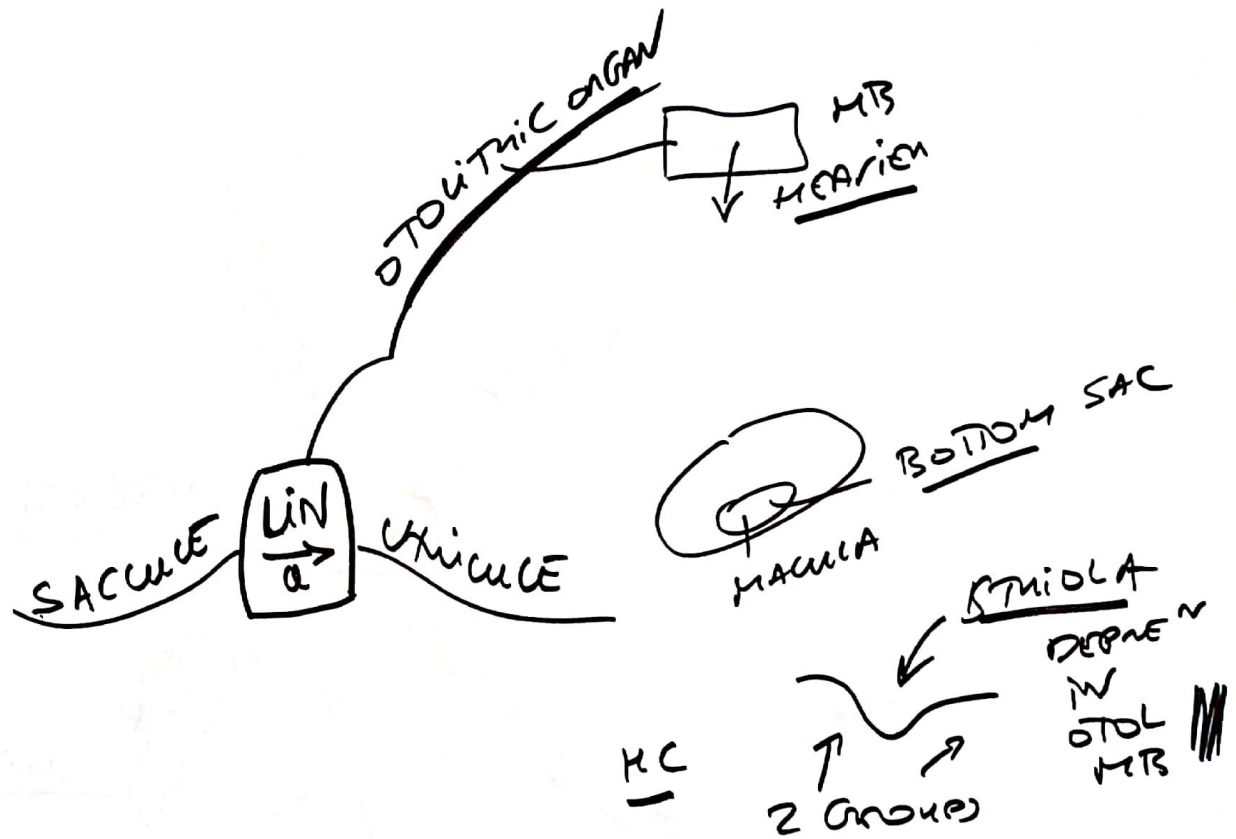
SIGNAL  
SAME DIRECTION  
MUT = EFFECTS

PAIRING OF  
SCC &  
TRAK OUTWARD  
IN HEAD  
RELATIVE TO  
EACH OTHER







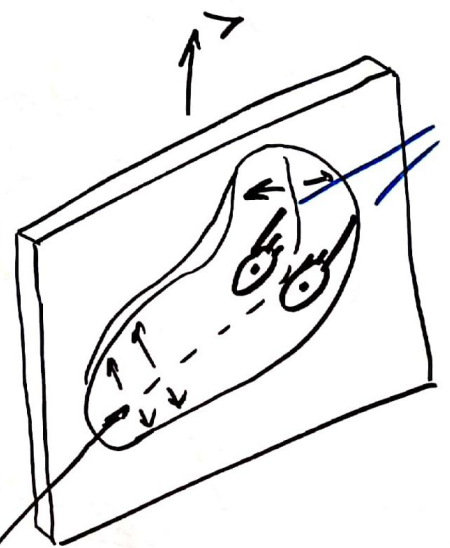


IN MEDIAL  
LEAF  
SAC

MACULA  
OF  
SACCLE

STIMULAT

UNILUE



ALONG  
↓  
VERTICAL PLANE  
UP & DOWN MVT  
ON TO UTRIC  
& STACULUM  
TILTS

ORIENTAN  
SACCUL  
&  
UNILUE  
IN INNER  
& ORIENTAN  
HC IN  
MACULAE

KINOLININ  
ORIENTAS  
TOWARD  
STIMULAT

DETECT  
LIN MVT  
IN HOR PLANE  
IN 2 DIRECTION

TRIPLE  
DISPLAC ON  
TILTS R  
C

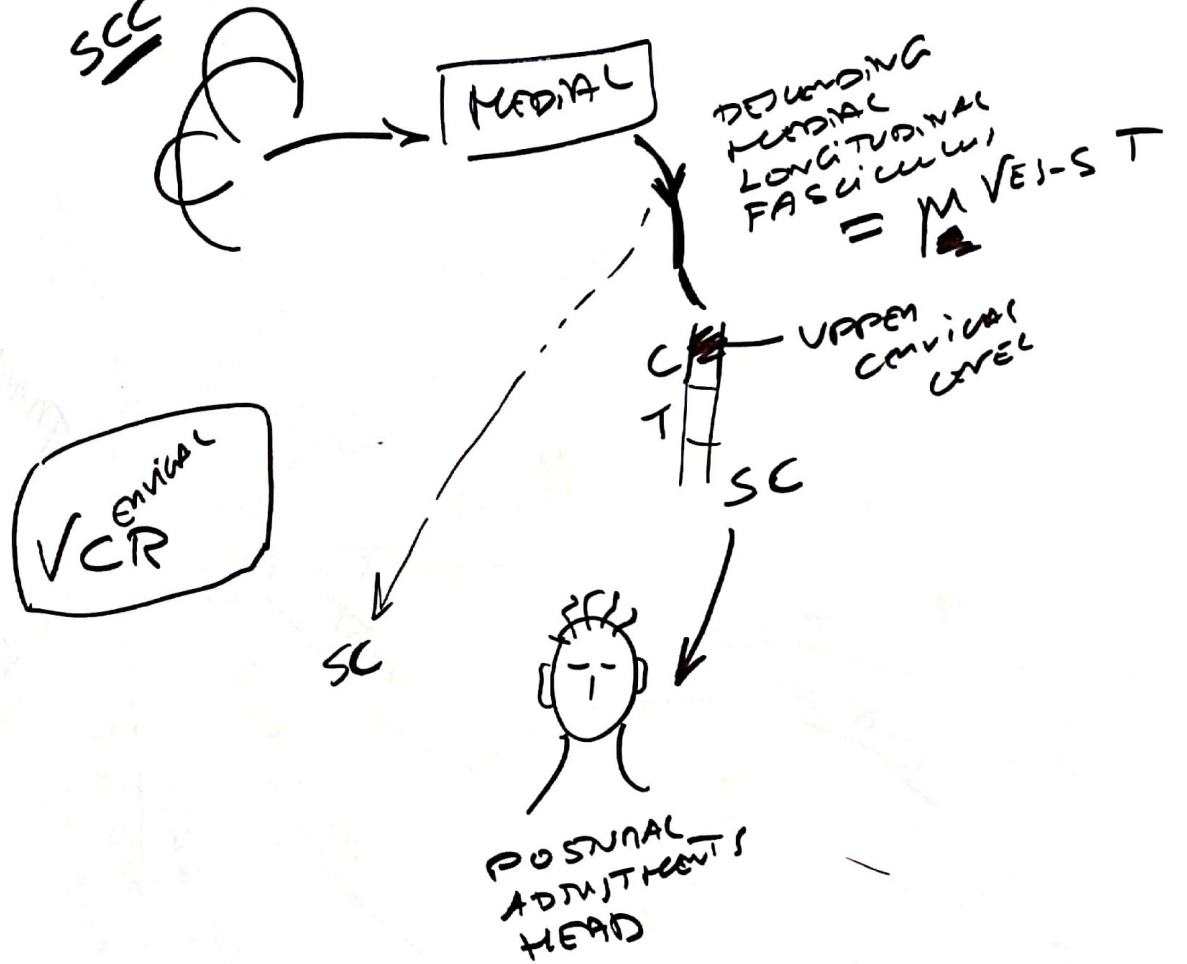




J & M  
VES INCC  
in POSTMAX  
MEDULLA

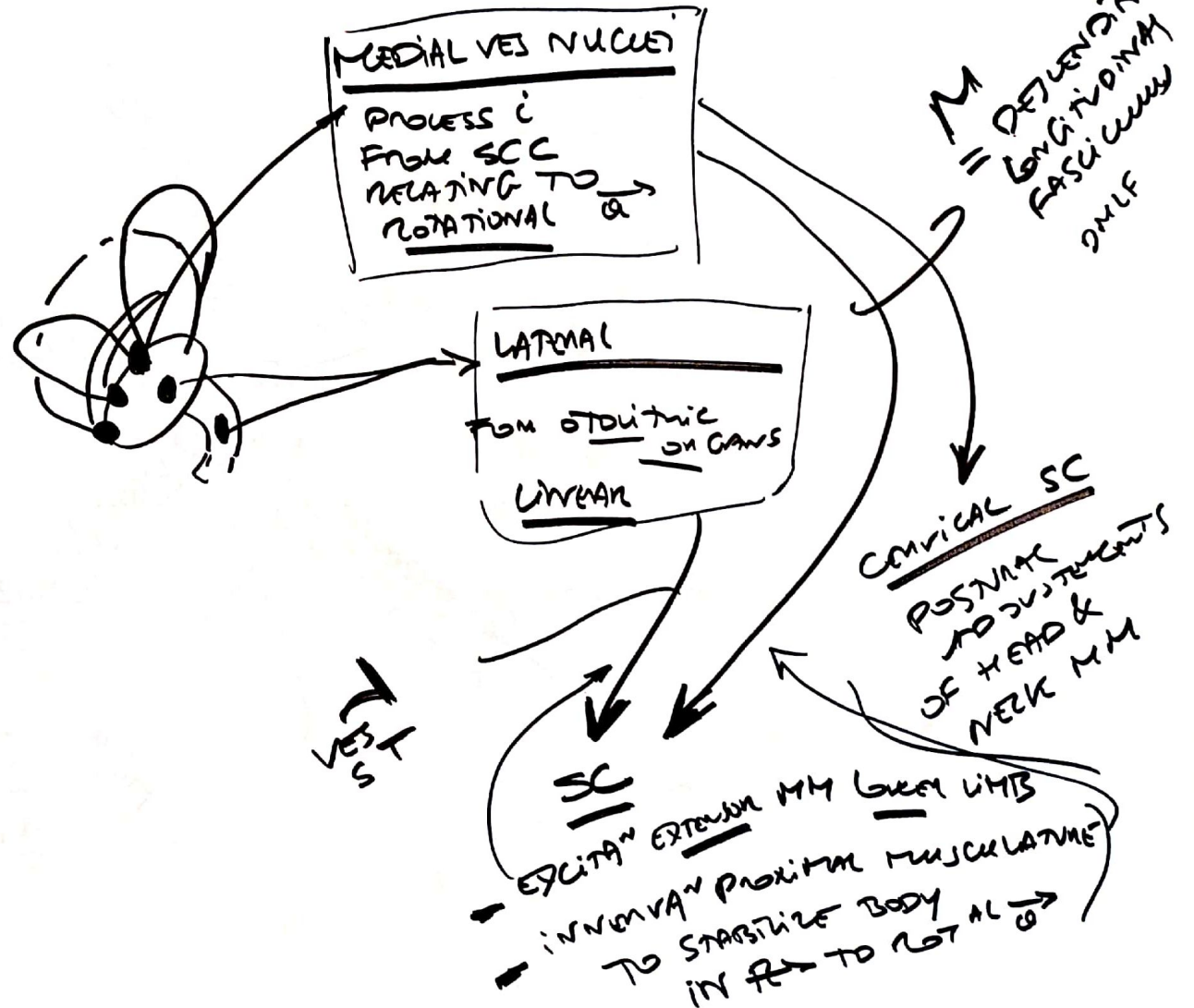


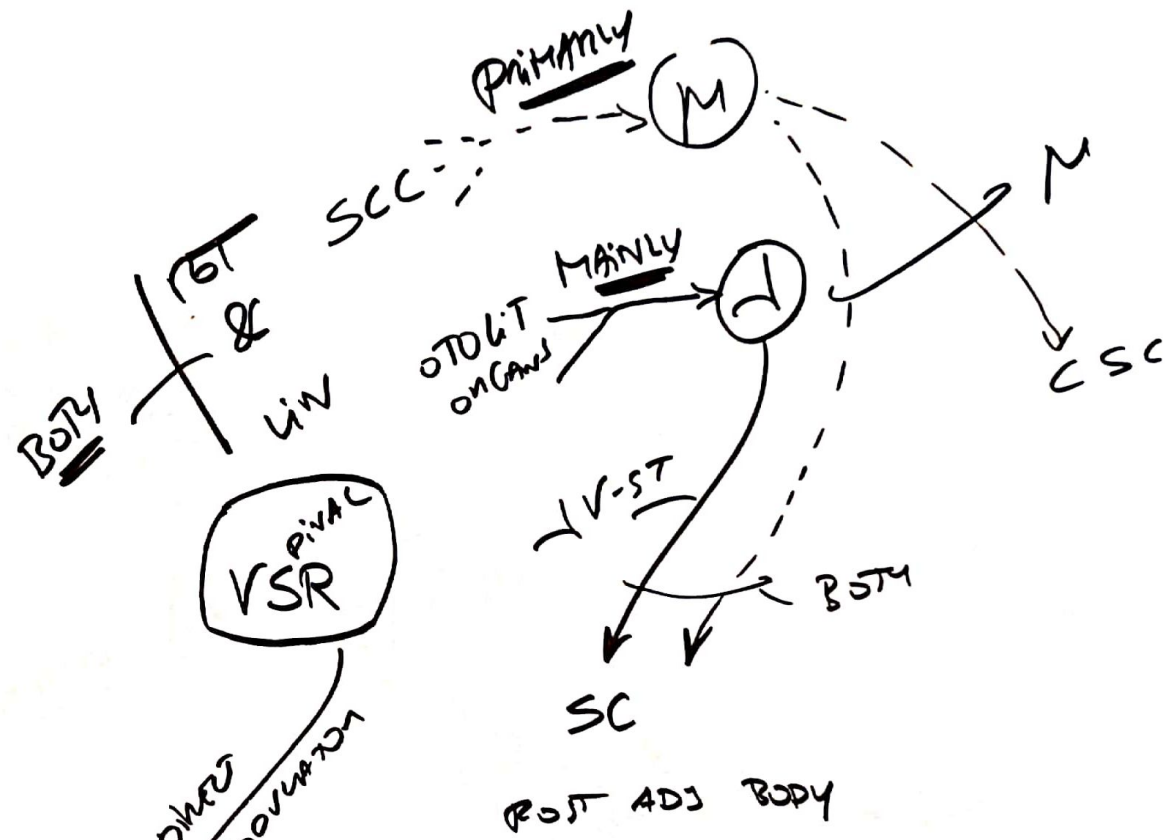
SCC ROTAL MVT





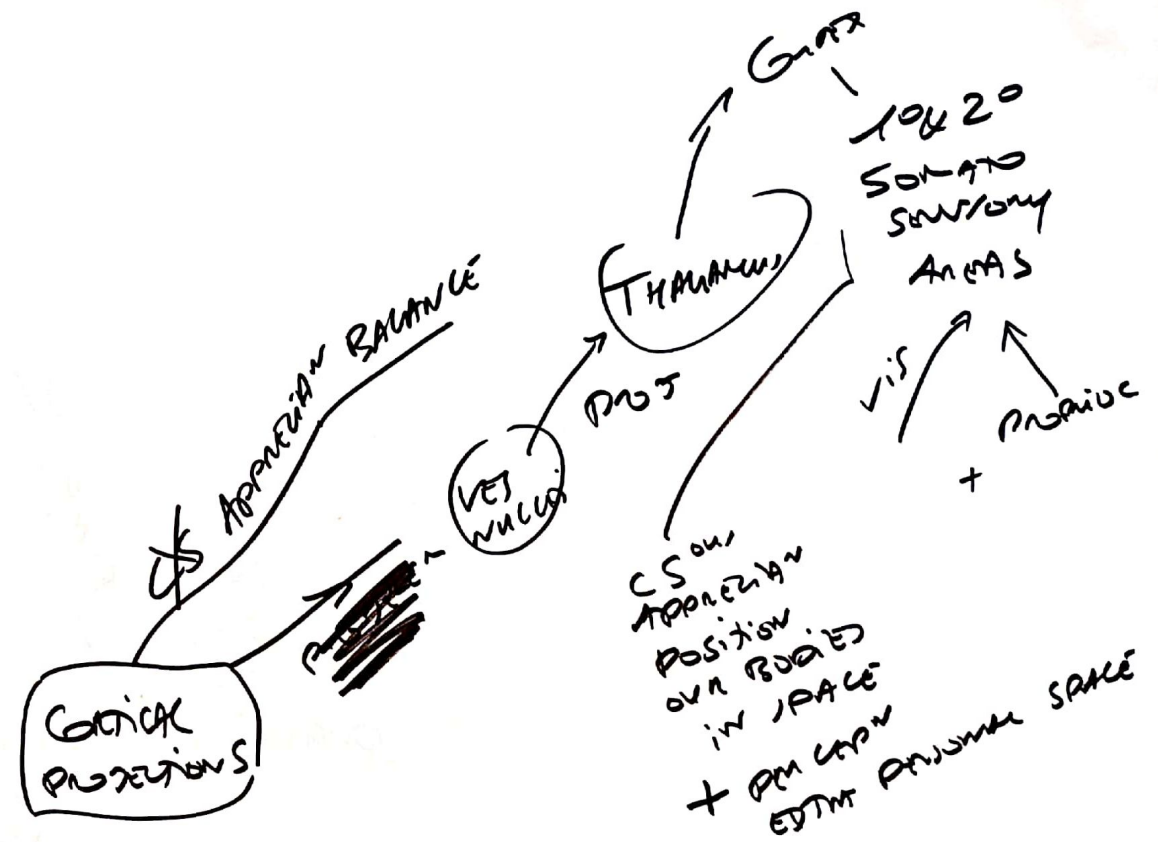
28  
OVERVIEW  
VES PATHS





A series of handwritten notes and symbols:
 

- A large, stylized symbol resembling a '3' or 'S' with a horizontal line through it.
- Below the symbol, 'V-EST' is written.
- To the right, 'NPUT' is written with a circled plus sign (+).
- Further right, 'EXTENSION MM UZ' is written.
- Below that, 'BARRAGE POSITIONAL SENSIBILITY' is written.
- At the bottom, 'ALSO INK POSITIONAL' is written.
- Below that, 'POST ADJ' is written with an arrow pointing to the right.





BRIEF SPELLS VERTIGO

↑  
MOTS HEAD

- ALTHOUGH  $\Delta$  TO GRAVITY IN  
FLOATING

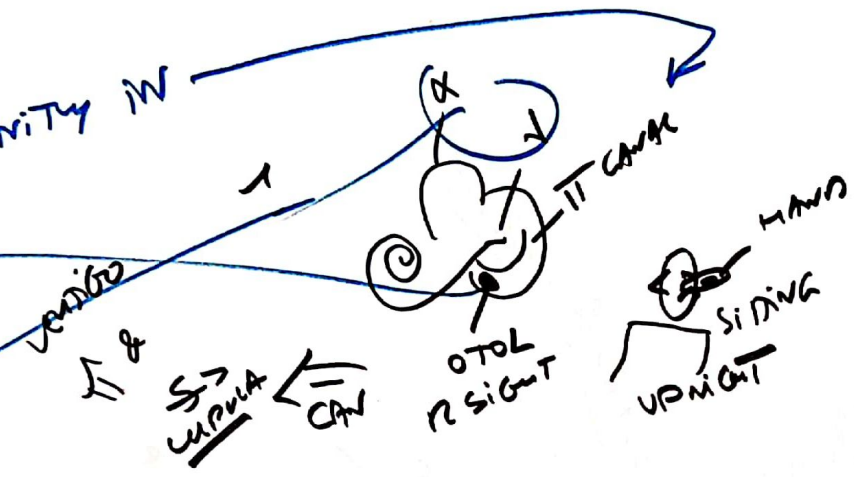
$\alpha$  &  $\theta$  OR  
SOMETIMES  
INVOLVED  
DISORDER  
UTRIANGLE INVERTED  
BUMP INTO UTRICULA

→ HC  
ISOLATED STIMULAN  
IT SEC  
ONE SIDE  
→ VERTIGO

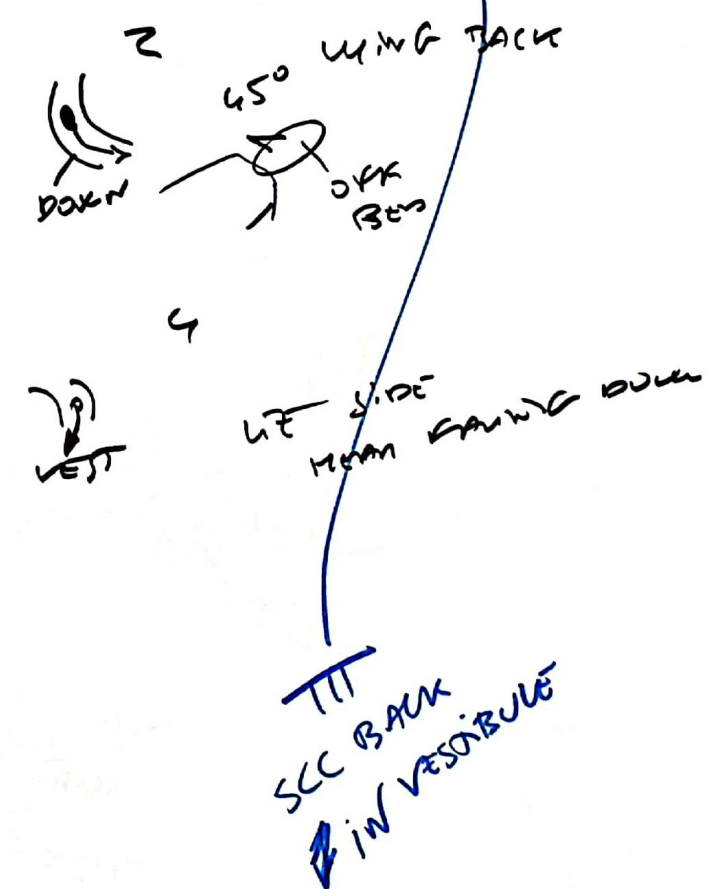
- ADDED SIDE  
SUPERIOR  
HEAD ROTATES  
ONE SIDE

→ VERTIGO  
APPROX 90 DEGREE

→ VENTRAL  
& TENSIONAL  
NYSTAGMUS  
+ VERTIGO



MC  
PVES  
DISORDER &  
EPLER MANEUVER



+VERTIGO!  
LE  
→

