

Parodontite : explorer sa répercussion systémique

Dre med.dent. Alkisti ZEKERIDOU, MAS, Maître-Assistante en Recherche et Enseignement, Division de Médecine dentaire régénérative et Parodontologie

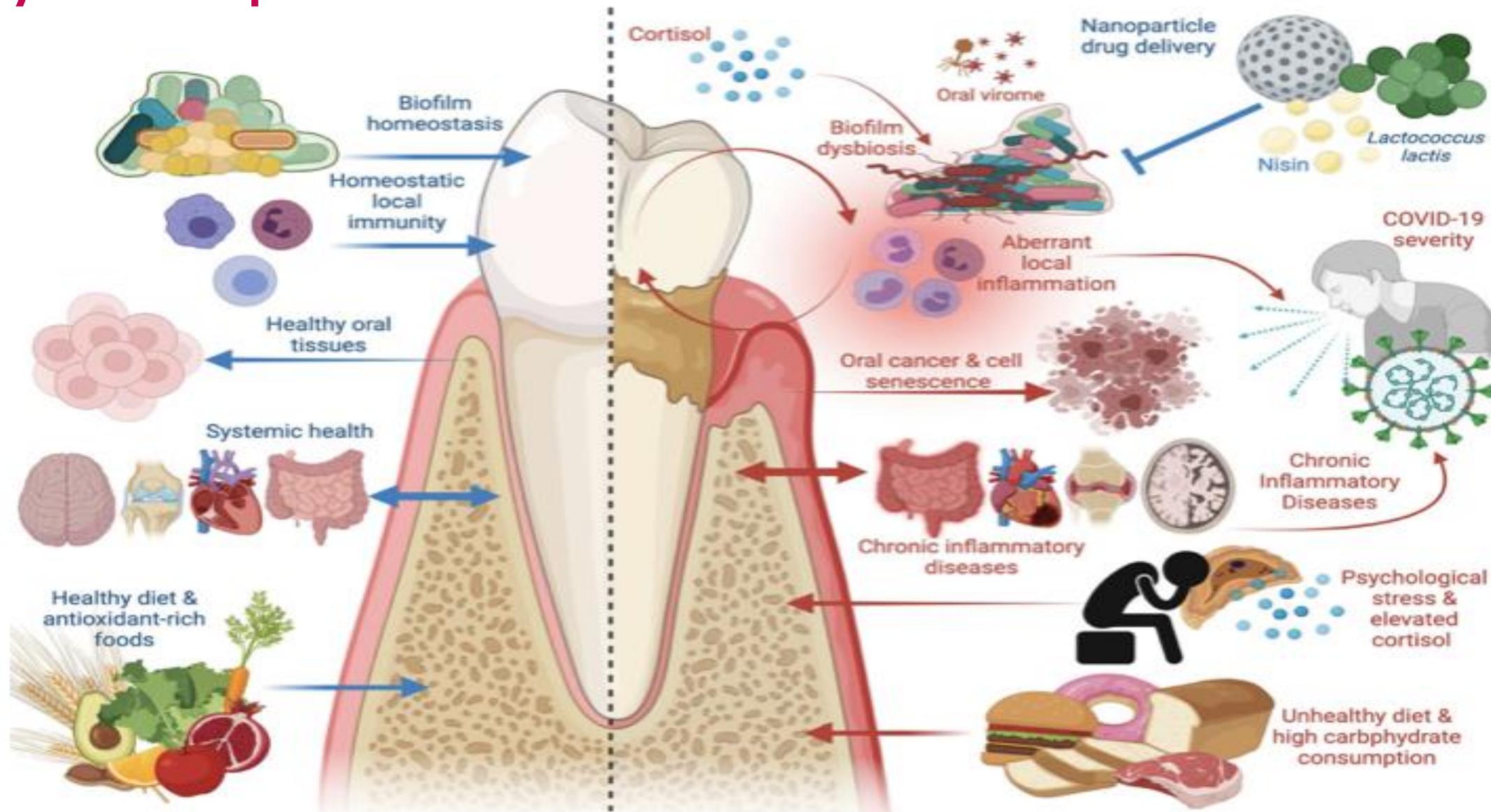
FACULTÉ DE MÉDECINE

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UNIVERSITÉ
DE GENÈVE

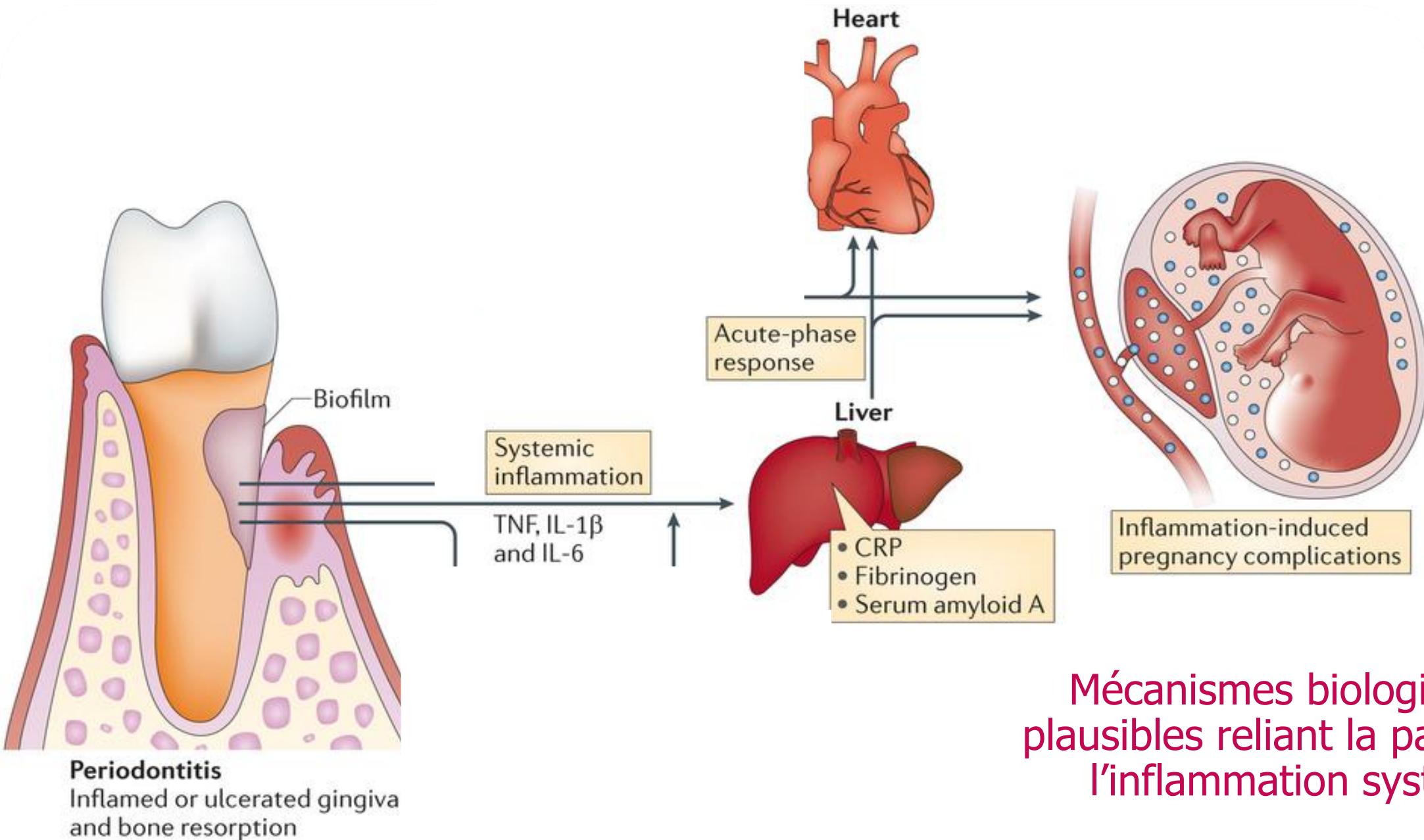
Systémique vs Local



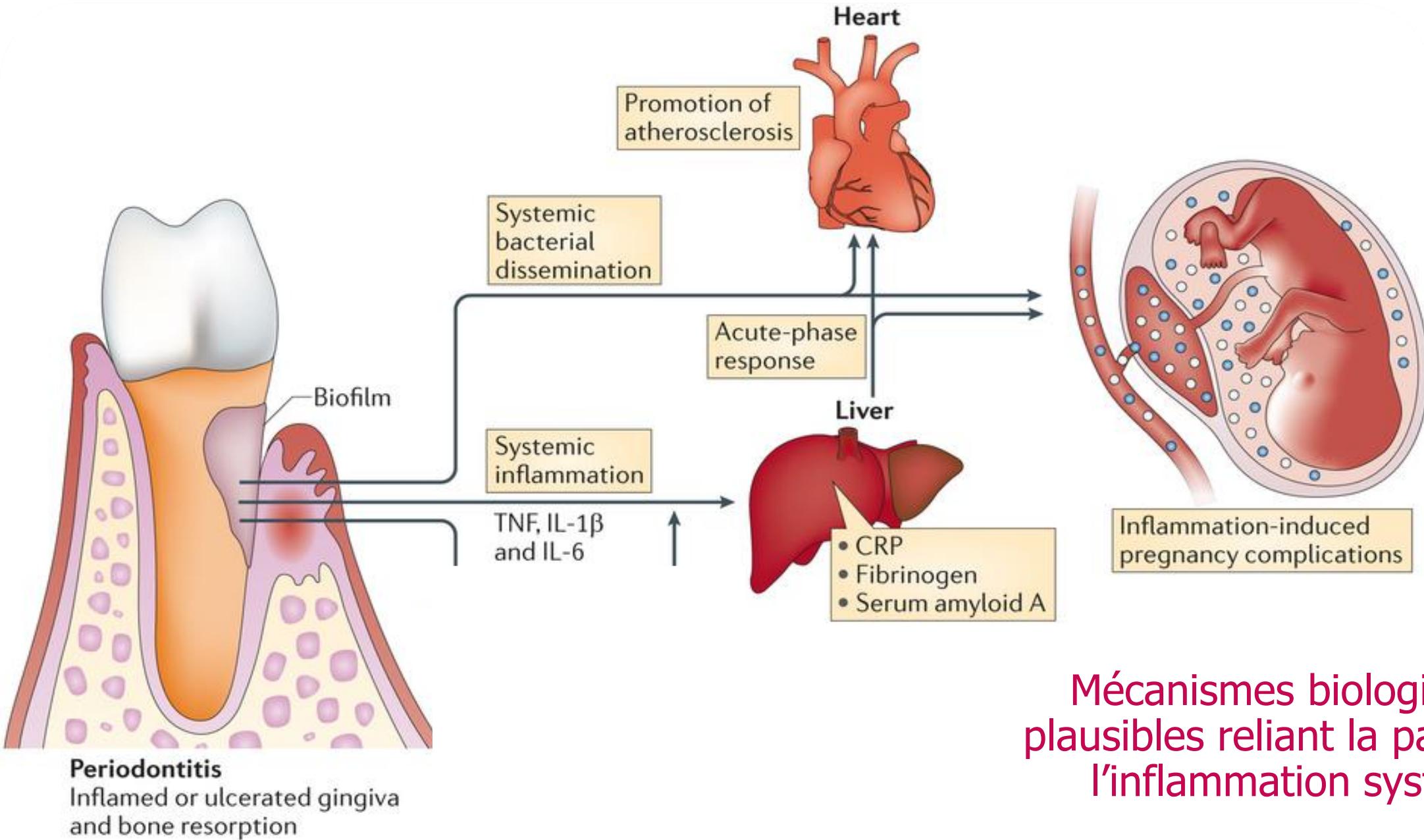
Historique : anciennes civilisations

- ❖ Les Hébreux comparaient le corps à une maison, la bouche représentant la porte d'entrée qui devait rester propre pour éviter les contaminations
- ❖ Les Grecs considéraient que des dents saines étaient un indicateur de bonne santé et préconisaient des règles d'hygiène dentaire précises
- ❖ Hippocrate a décrit un patient atteint de « arthrite rhumatoïde » qui a été traité par l'extraction d'une dent
- ❖ Galien a décrit la relation entre la cavité orale et certaines maladies

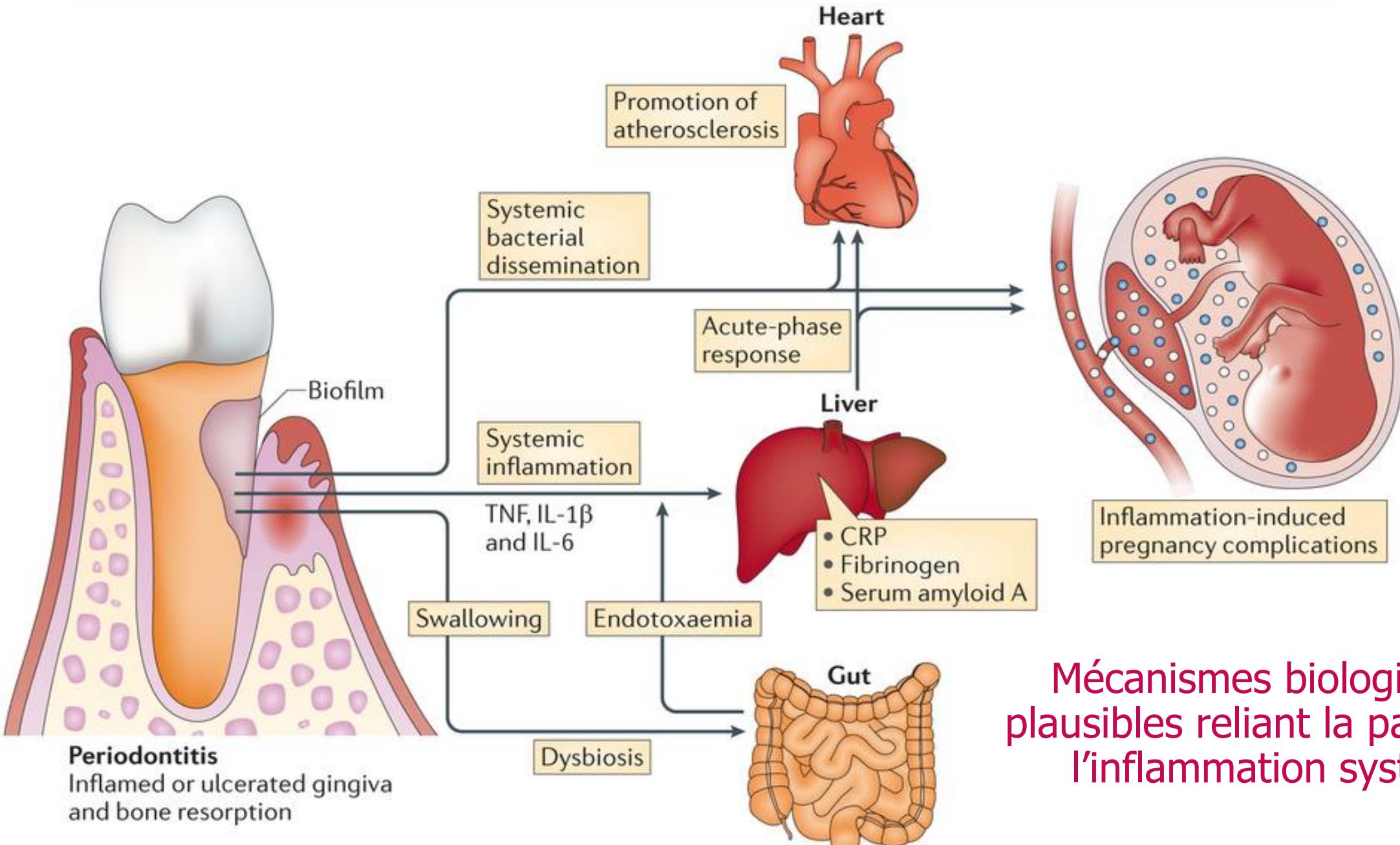




Mécanismes biologiquement plausibles reliant la parodontite à l'inflammation systémique



Mécanismes biologiquement plausibles reliant la parodontite à l'inflammation systémique



Mécanismes biologiquement plausibles reliant la parodontite à l'inflammation systémique



Systémique vs Local

Table 1: Study population, blood samples and sites of GCF sampling

Sites	PERIO Patients (P) N:24			HEALTHY participants (H) N:60	
	PP: PD≥5 mm	PH:PD≤3 mm	Blood sample	HH: PD<4 mm	Blood sample
Baseline	✓	✓	✓	✓	✓
SRP	✓				
Month 1	✓	✓	✓		
Month 3	✓	✓	✓		

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DOI: 10.1002/ced.2451

ORIGINAL ARTICLE

Effect of initial periodontal therapy on gingival crevicular fluid cytokine profile in subjects with chronic periodontitis

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²Division of Immunology, University Hospitals of Geneva, Geneva, Switzerland

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Abstract
Cytokines are thought to play an important role in the pathogenesis of periodontal disease. Because periodontal disease is known for its inhomogeneous distribution within the dentition, it is unclear to what extent the detection of various cytokines at different sites correlates with presence of disease. We evaluated whether levels of 12 cytokines in gingival crevicular fluid (GCF) discriminated periodontally diseased sites from healthy ones, or periodontally diseased persons from healthy ones, and assessed the impact of nonsurgical periodontal therapy on these readings. This study included 20 periodontally healthy persons (H) and 24 patients with chronic periodontitis (P).
Accepted: 25 November 2016 | Revised: 10 December 2016 | Accepted: 11 December 2016
DOI: 10.1002/ced.2452

ORIGINAL ARTICLE

Systemic inflammatory burden and local inflammation in periodontitis: What is the link between inflammatory biomarkers in serum and gingival crevicular fluid?

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¹School of Periodontology, University Clinic of Dental Medicine, University of Geneva, Geneva, Switzerland

Correspondence:
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Email: alkisti.zekerdou@unige.ch

Abstract
In periodontitis patients, high levels of several inflammatory markers may be expressed in serum, reflecting the effect of local disease on the general health. The objective of the present analysis was to compare cytokine levels assessed in peripheral blood with those in the gingival crevicular fluid (GCF) and evaluate the impact of nonsurgical periodontal therapy on the incidence of high levels of 12 biomarkers in serum. Twenty-four patients with chronic periodontitis (Group P) contributed with serum and GCF samples at baseline (BL) and 1 and 3 months after periodontal treatment (M1 and M3). Samples were assessed for 12 cytokines using the Bio-Plex bead array multianalyte detection system. For each analyte, peak values were calculated as greater than the mean + 2SD of the one found in 60 periodontally healthy participants. Significant correlations between serum and GCF values were obtained in the periodontitis group for interleukin (IL) 1 α , IL-6, and interferon γ (37.5% at BL and for macrophage inflammatory protein 1 β at M3 after treatment. Periodontitis subjects were found to exhibit high peaks for several inflammatory markers in serum. The highest incidence of peaks at BL was found for interferon γ (37.5% of the periodontitis subjects). For the four biomarkers with a detection frequency >75% at BL (IL-1 α , IL-6, macrophage inflammatory protein 1 β , and vascular endothelial growth factor), no significant difference was observed over time for the P group or between the two groups at BL. The significant correlation found between the serum and the GCF for certain cytokines and the fact that periodontitis subjects exhibit high peaks for several inflammatory markers in serum may support the hypothesis that the inflammatory reaction due to periodontitis is not restricted to the diseased sites. Within the limitations of the study, periodontal therapy did not seem to have any significant impact on the systemic cytokine levels.

KEYWORDS
cytokines, periodontal disease, periodontal treatment, serum

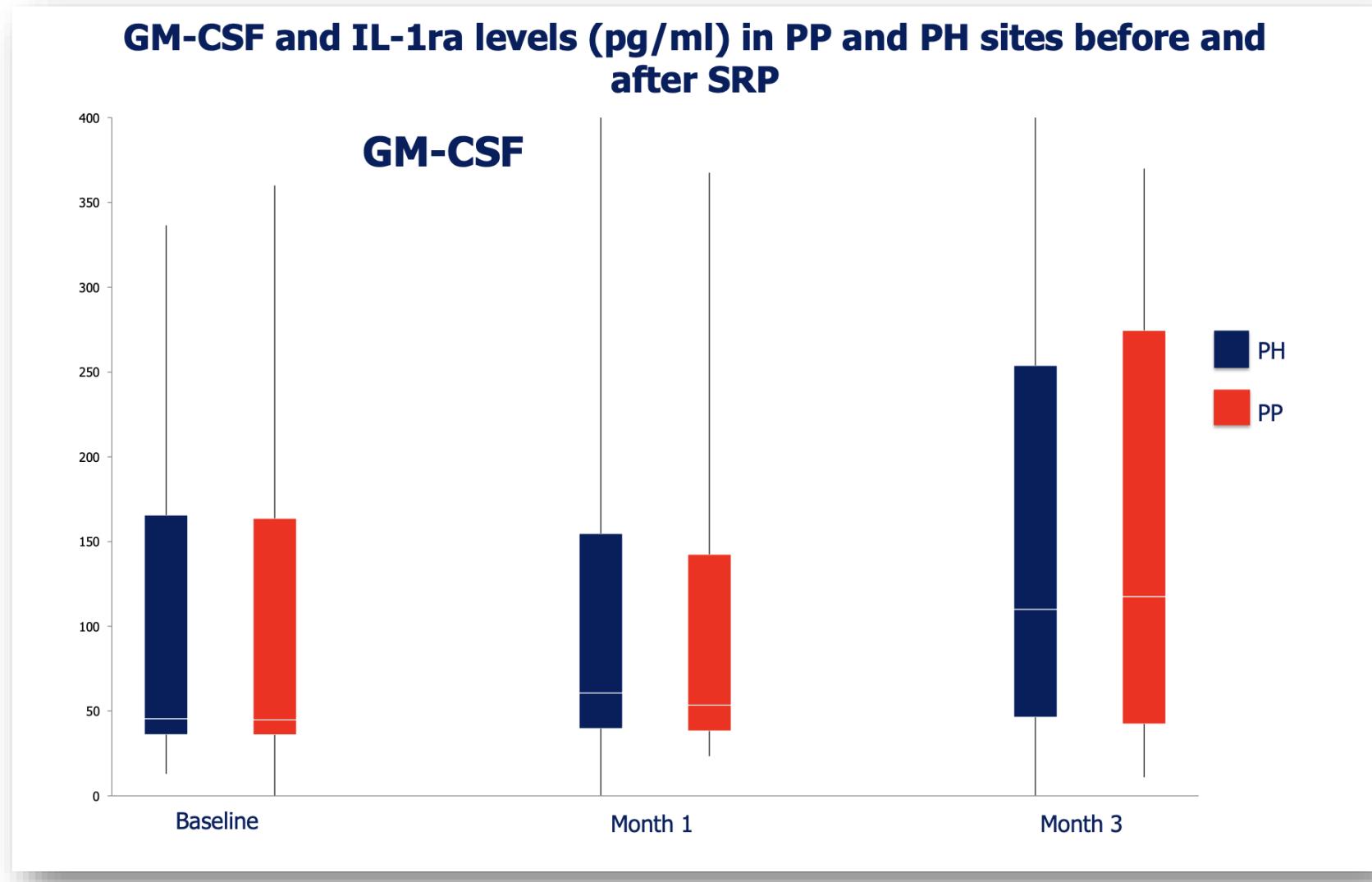
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Clin Exp Dent Res. 2019;1–8.

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- Effect of initial periodontal therapy on gingival crevicular fluid cytokine profile in subjects with chronic periodontitis., Zekerdou et al. 2017., Clin Exp Dent Res. 2017
- Systemic inflammatory burden and local inflammation in periodontitis: What is the link between inflammatory biomarkers in serum and gingival crevicular fluid? Zekerdou et al., Clin Exp Dent Res. 2019

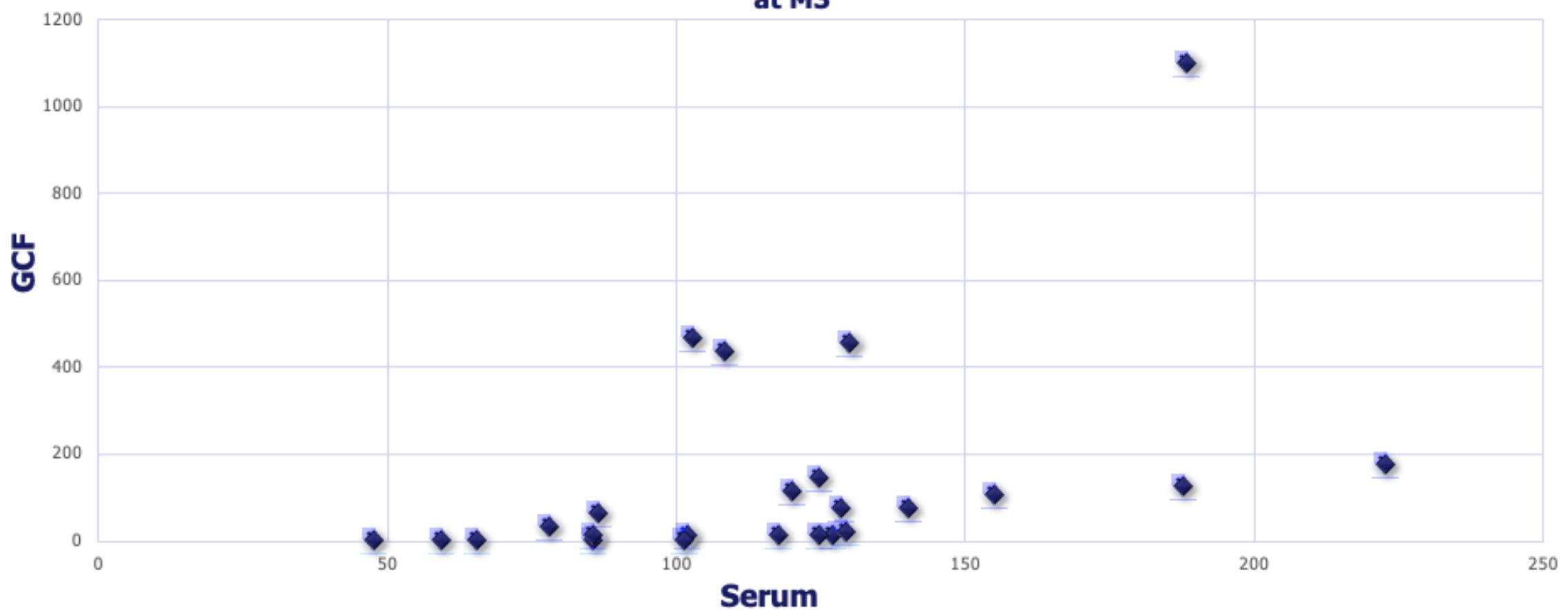
Systémique vs Local



- Effect of initial periodontal therapy on gingival crevicular fluid cytokine profile in subjects with chronic periodontitis., Zekerdou et al. 2017., Clin Exp Dent Res. 2017
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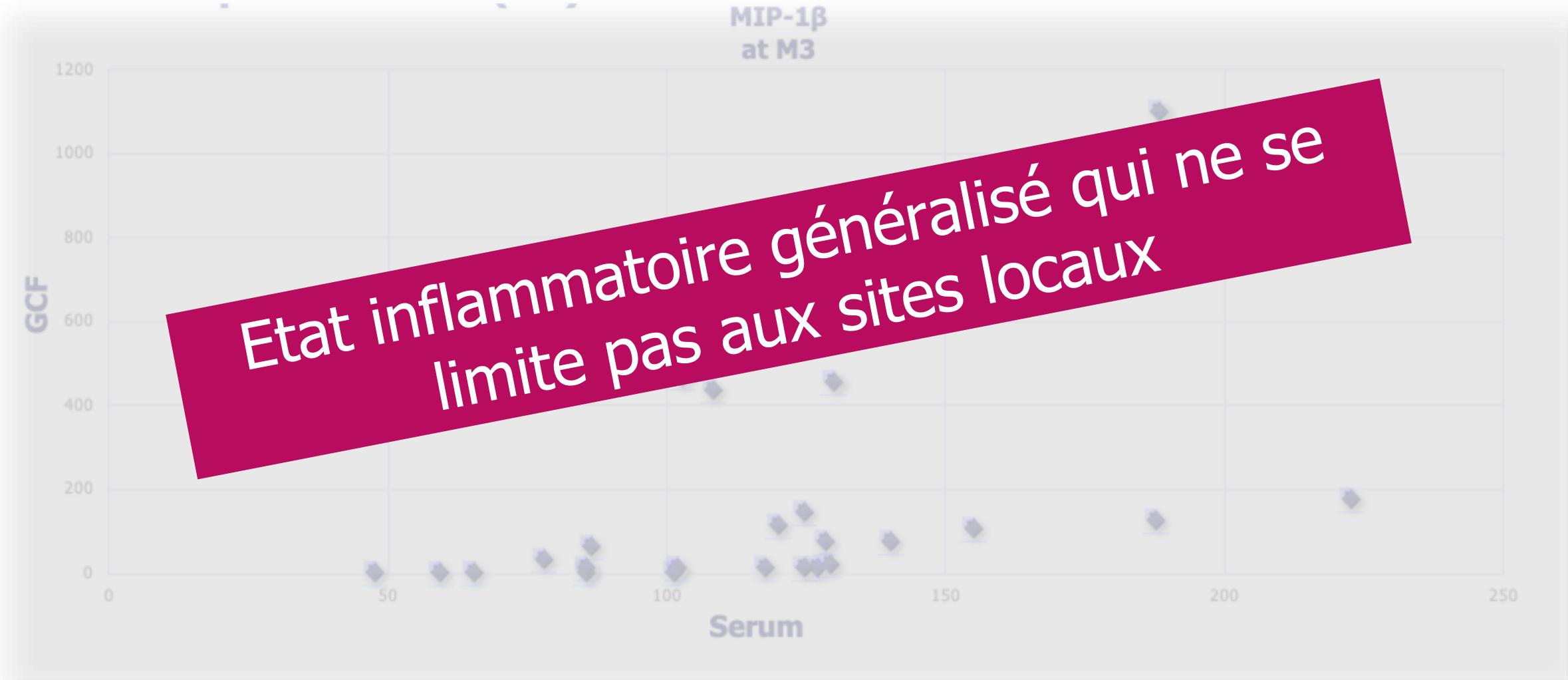
Systémique vs Local

**MIP-1 β
at M3**



- Effect of initial periodontal therapy on gingival crevicular fluid cytokine profile in subjects with chronic periodontitis., Zekerdou et al. 2017., Clin Exp Dent Res. 2017
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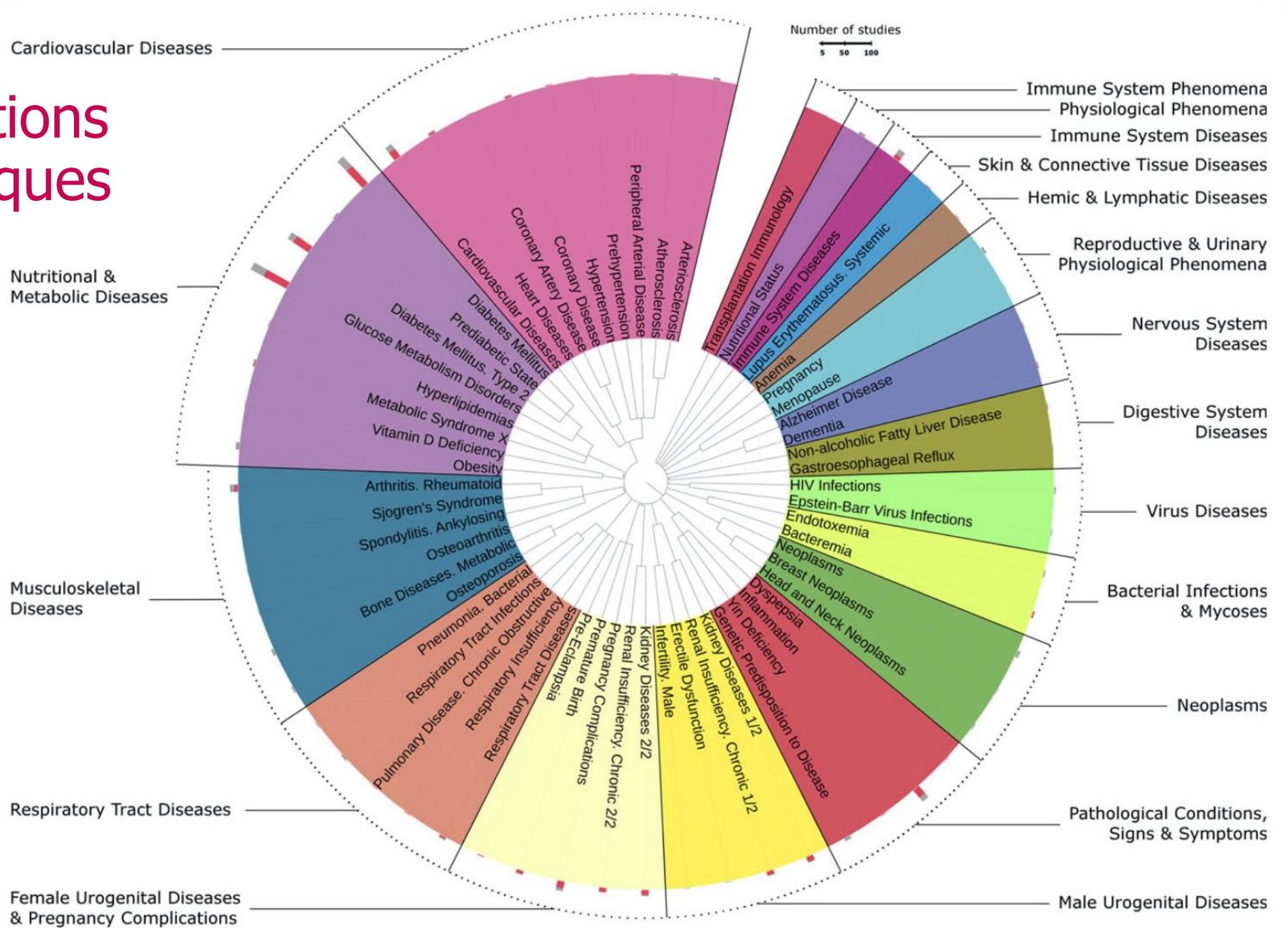
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Associations systémiques



Nouvelle classification de maladies parodontales

Papapanou

et al 2018

Conditions parodontales saines et pathologiques

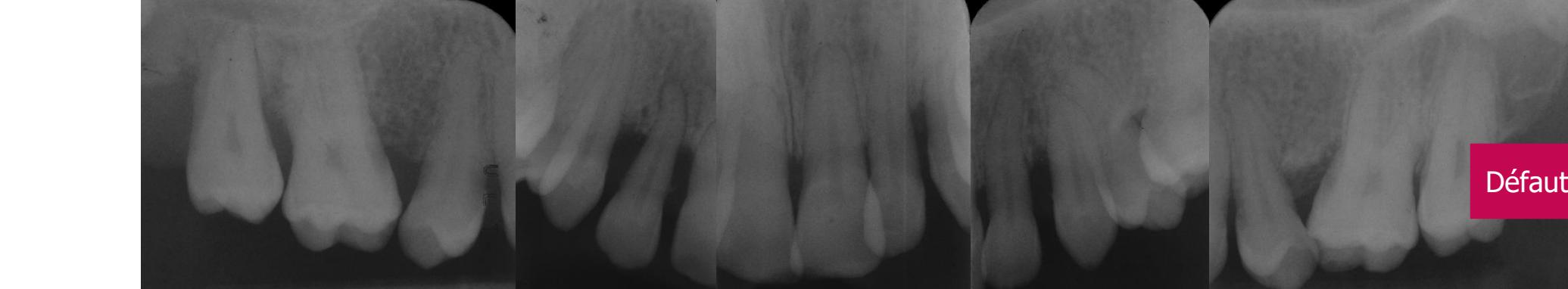
Santé parodontale et maladies gingivales			Parodontites		Autres pathologies affectant le parodonte					
Santé gingivale et parodontale	Gingivite induite par la plaque	Gingivite non induite par la plaque	Maladies parodontales nécrotiques/nécrosantes	Parodontite	Parodontite comme manifestation d'une maladie systémique	Mal. Syst. affectant les tissus parodontaux	Abcès parodontal et lésion endo-parodontale	Altérations muco-gingivales	Traumatisme occlusal	Facteurs liés à la dent et à la prothèse

Conditions péri-implantaires saines et pathologiques

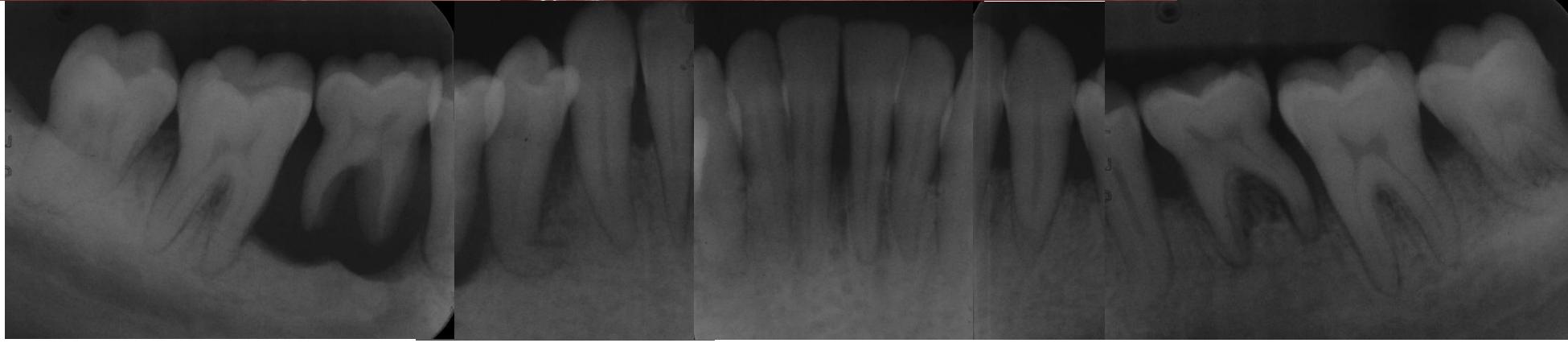
Santé péri-implantaire	Mucosite péri-implantaire	Péri-implantites	Déficience des tissus mous et durs péri-implantaires
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Down's Syndrome (Trisomie 21)



Défauts de neutrophiles



VIH – SIDA





Associations systémiques

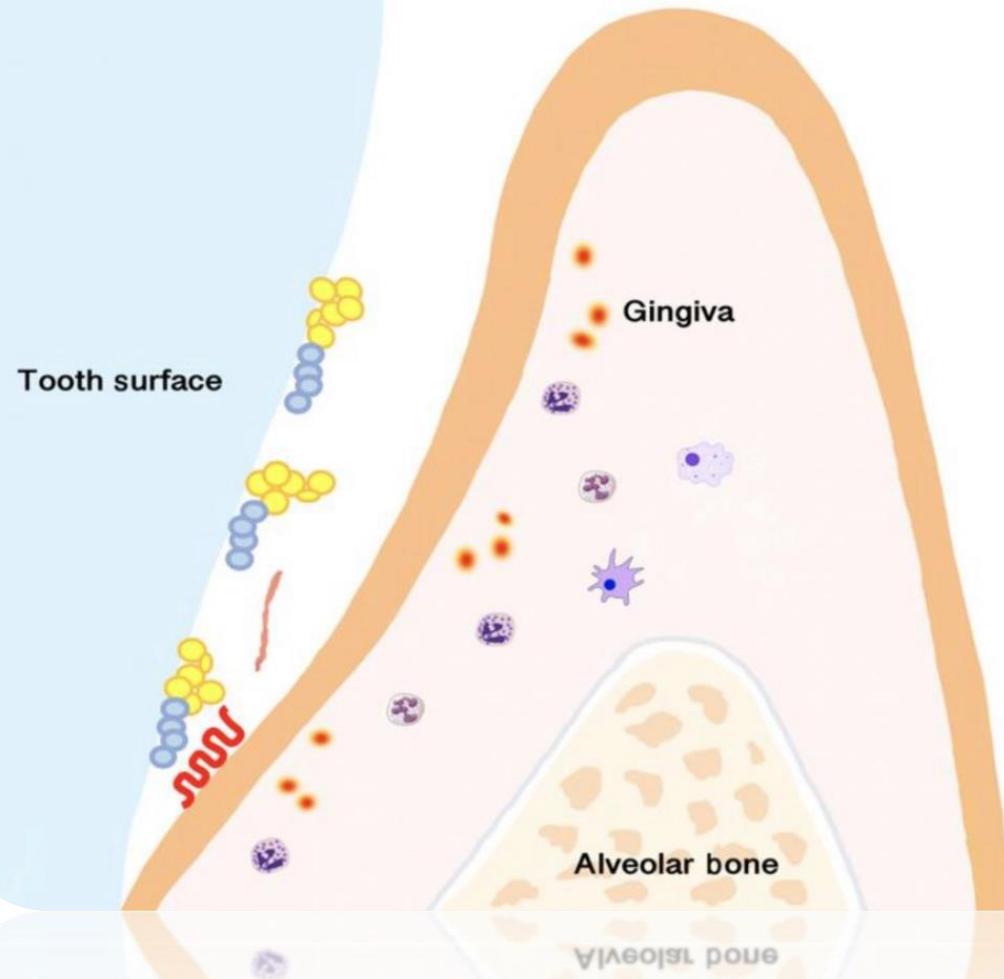
- ❖ Maladies ayant un impact variable sur la pathogénie des maladies parodontales
 - ✓ Diabète
 - ✓ Syndrome métabolique (Obésité, HTA, Cholestérol)
 - ✓ Maladies cardiovasculaires
 - ✓ Stress émotionnel et dépression
 - ✓ Autres: Arthropathies (polyarthrite rhumatoïde, arthrose), Parkinson, Alzheimer, pneumonie, ostéoporose, néphropathies chroniques, troubles érectiles...

Diabète

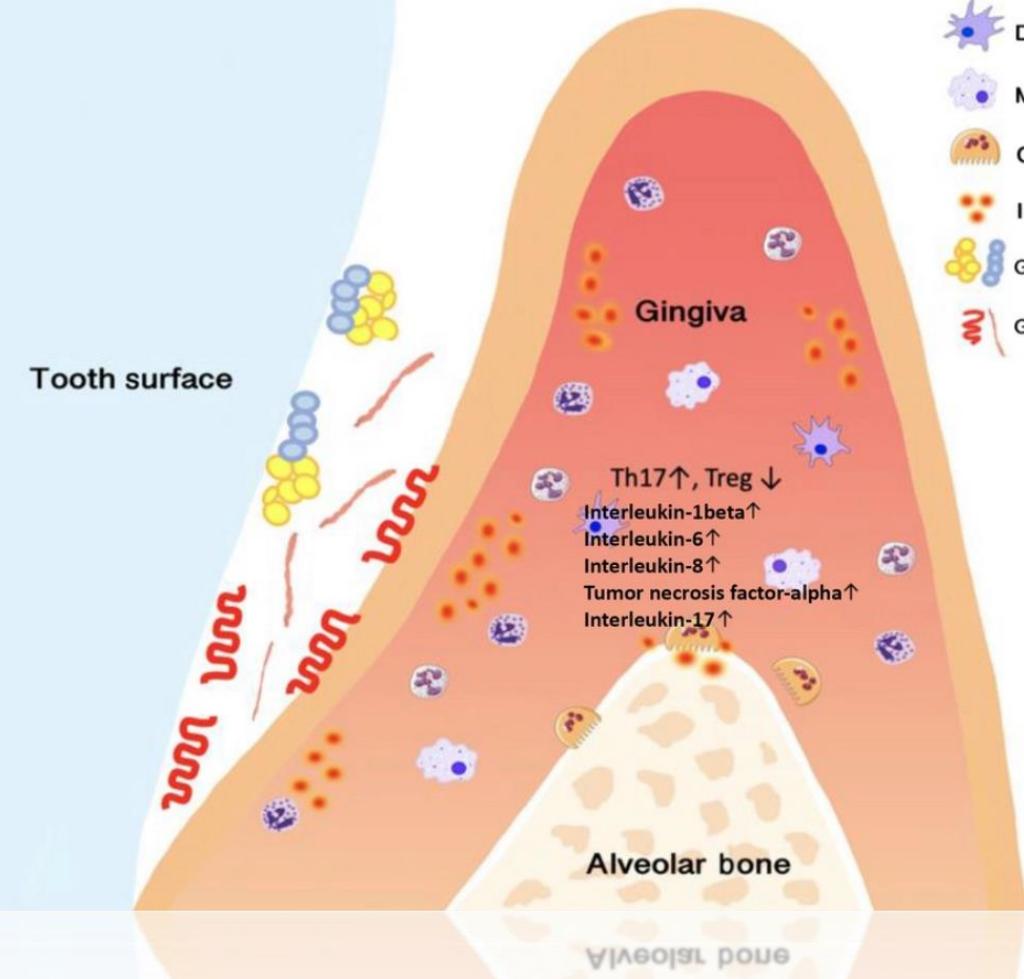


Diabète et parodontite

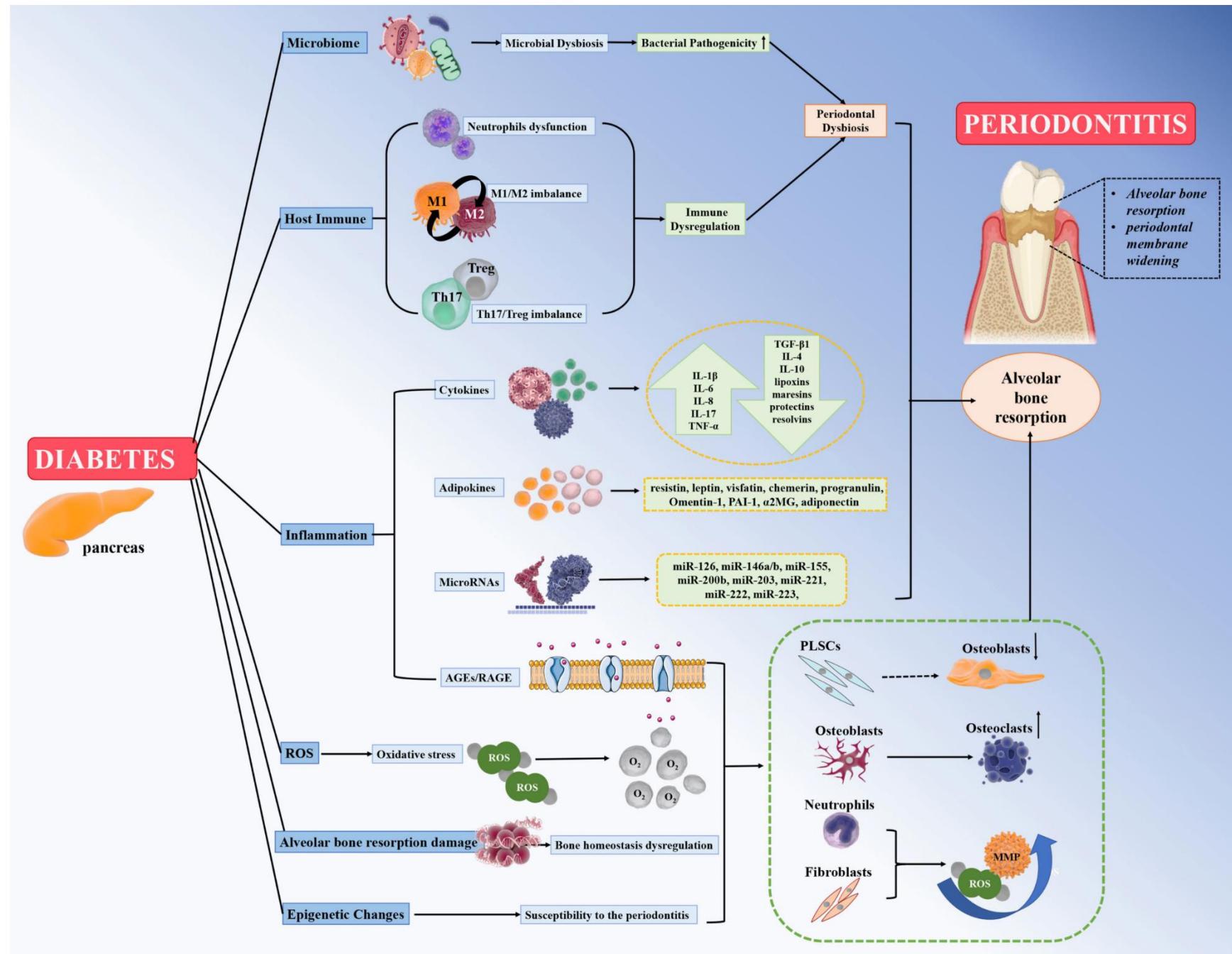
Normal



Diabetic



-  Lymphocytes
-  Neutrophils
-  Dendritic cells
-  Macrophages
-  Osteoclasts
-  Inflammatory mediators
-  Gram-positive bacteria
-  Gram-negative bacteria



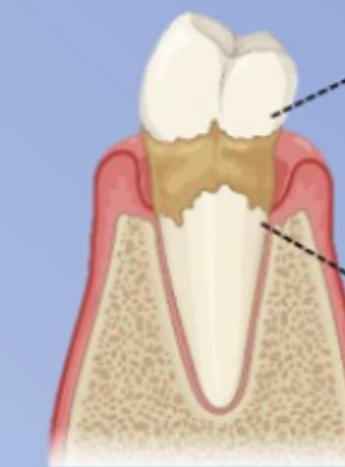


PERIODONTITIS

Periodontitis
is characterized by bone
loss, gingival
inflammation,
and tooth
migration.

Periodontal Dysbiosis

PERIODONTITIS



- Alveolar bone resorption
- periodontal membrane widening

DIABETES



pancreas

Microbiome



Microbial Dysbiosis

Periodontal Dysbiosis

Bacterial Pathogenicity ↑

Th17/Treg imbalance



TGF- β 1
IL-4
IL-10
Lipoxins
maresins
protectins
resolvins

Cytokines



IL-1 β
IL-6
IL-8
IL-17
TNF- α

Adipokines



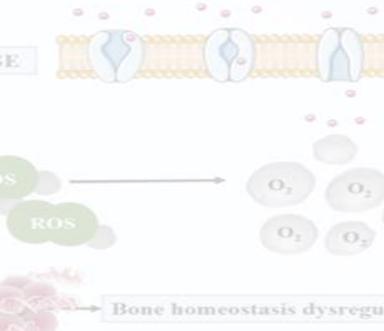
resistin, leptin, visfatin, chemerin, progranulin
Omentin-1, PAI-1, α 2MG, adiponectin

MicroRNAs



miR-126, miR-146a/b, miR-155,
miR-200b, miR-203, miR-221,
miR-222, miR-223,

AGEs/RAGE



PLSCs
Osteoblasts
Neutrophils
Fibroblasts

ROS

ROS

ROS

O₂
O₂
O₂

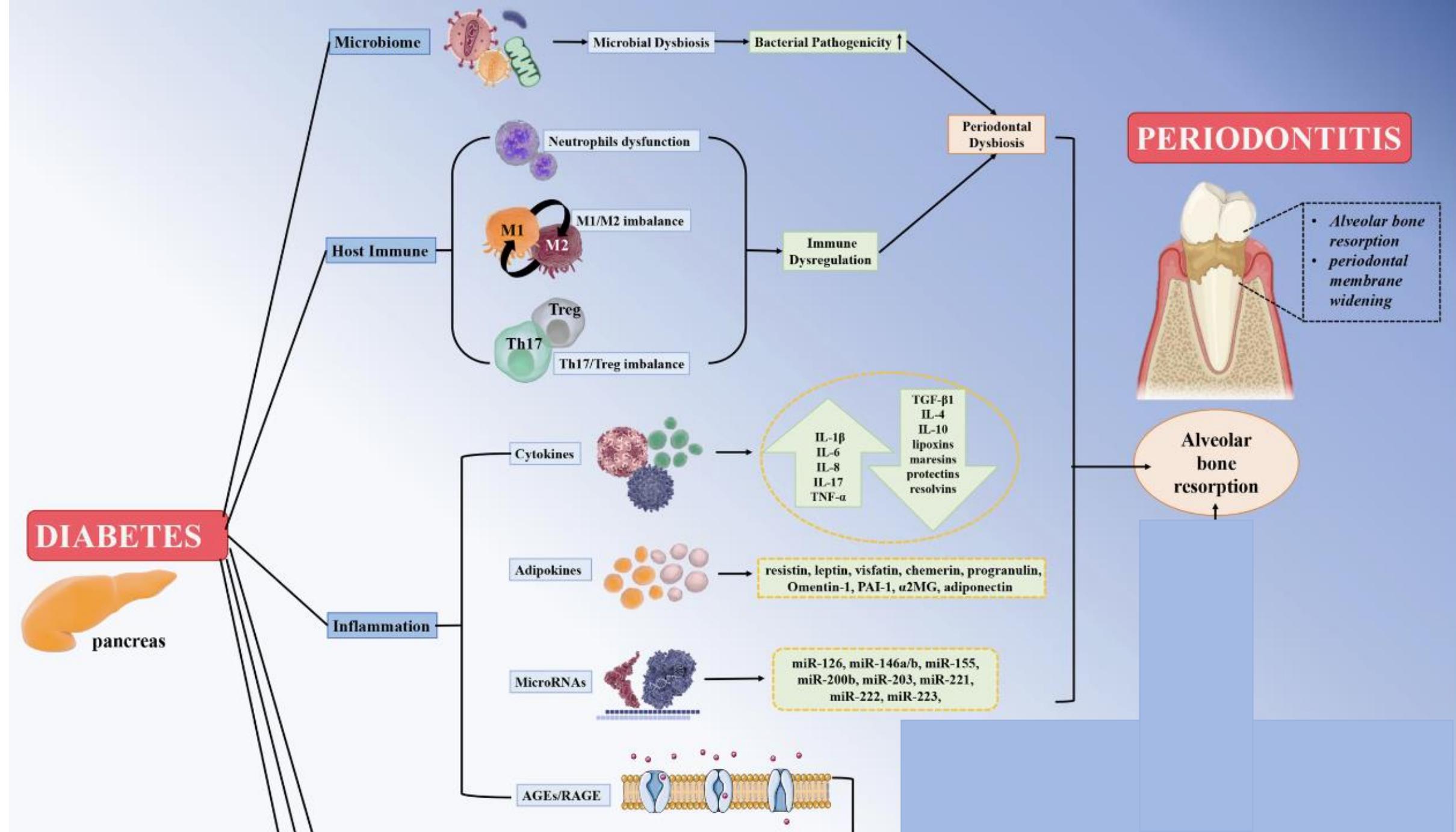
Alveolar bone resorption damage

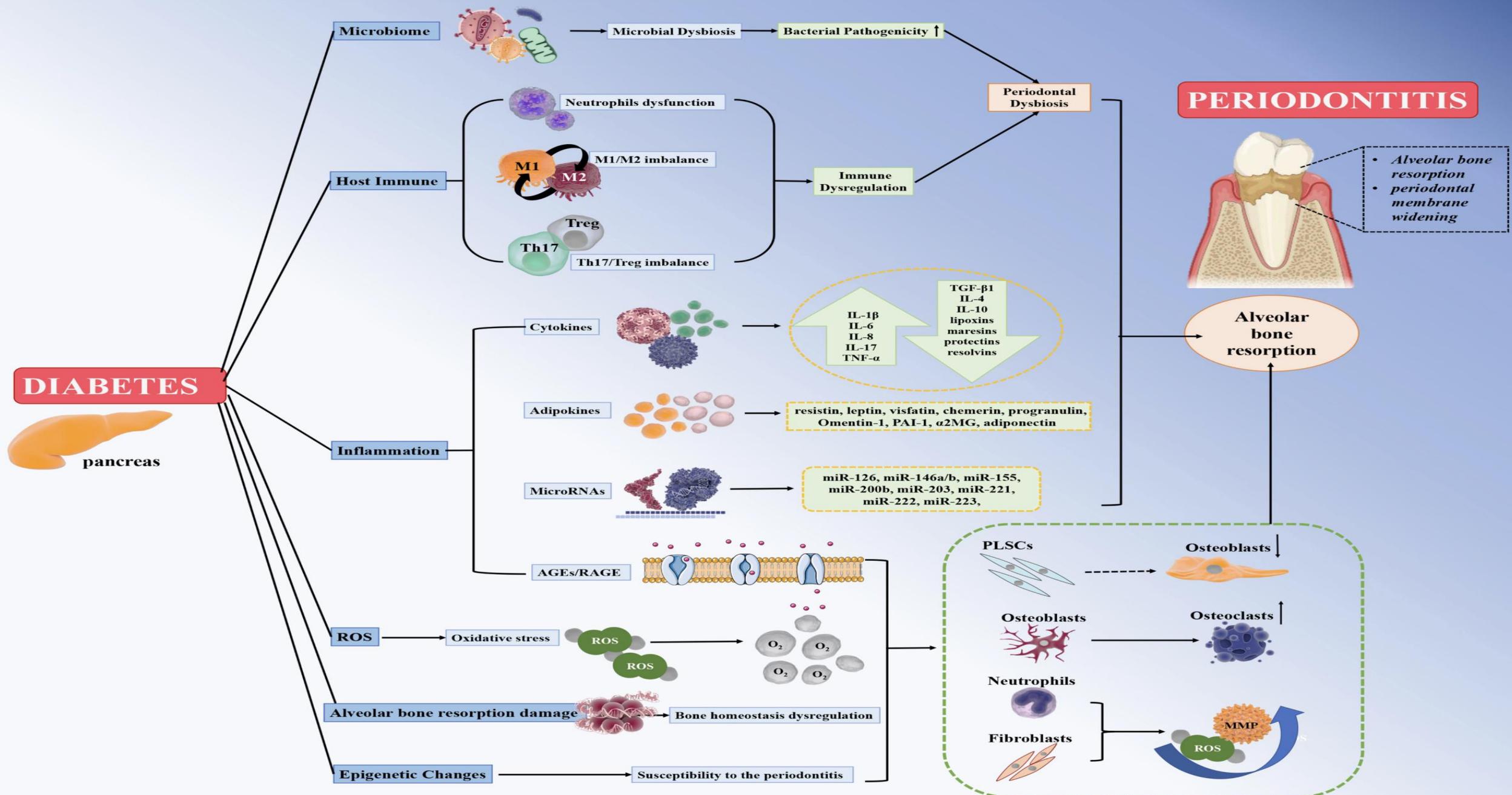


Bone homeostasis dysregulation

Epigenetic Changes

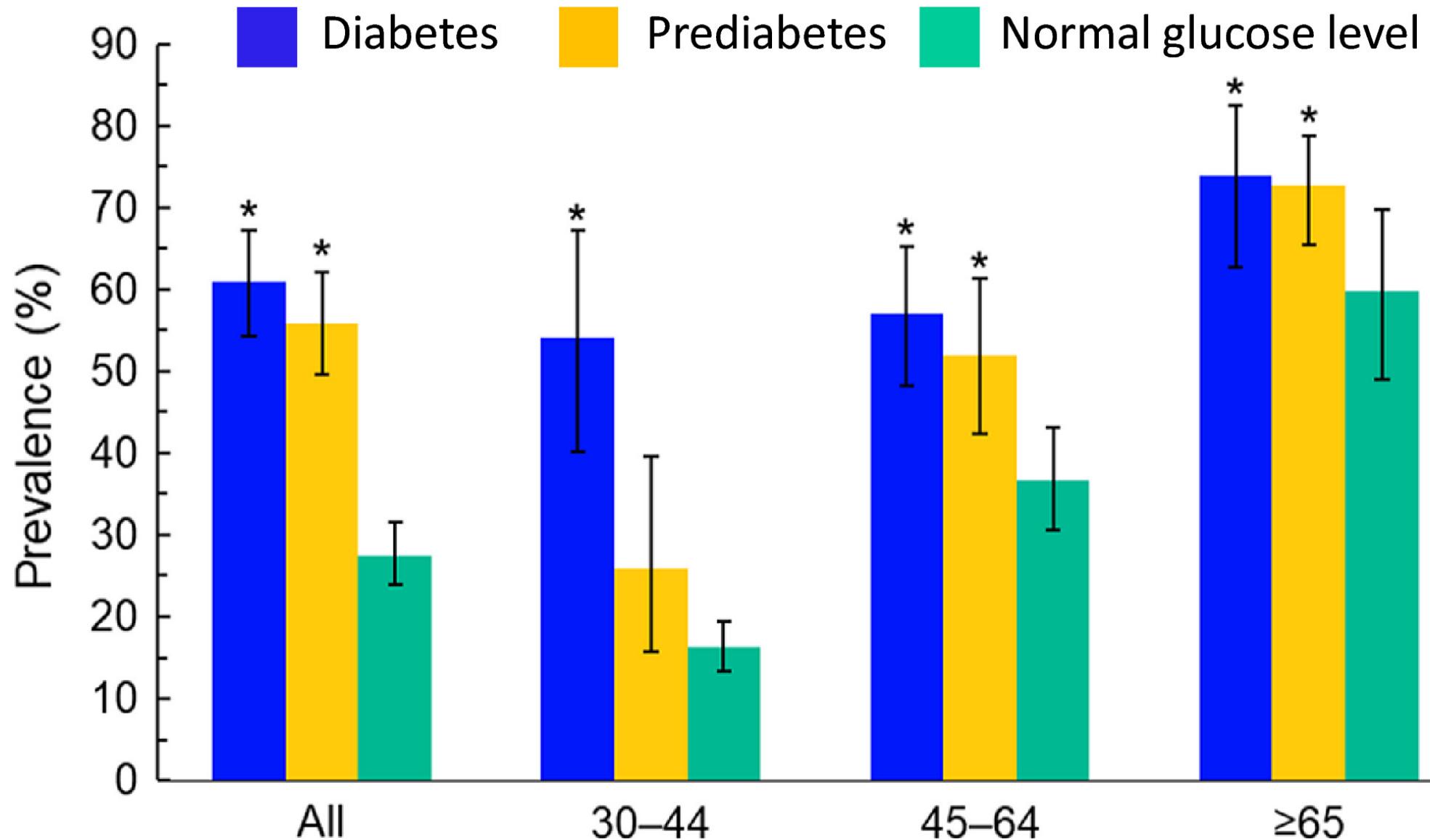
Susceptibility to the periodontitis



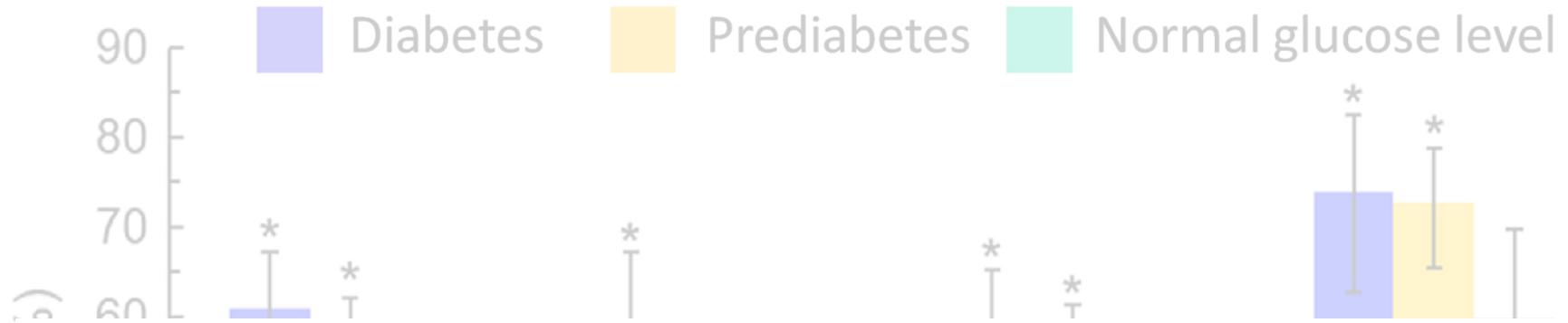




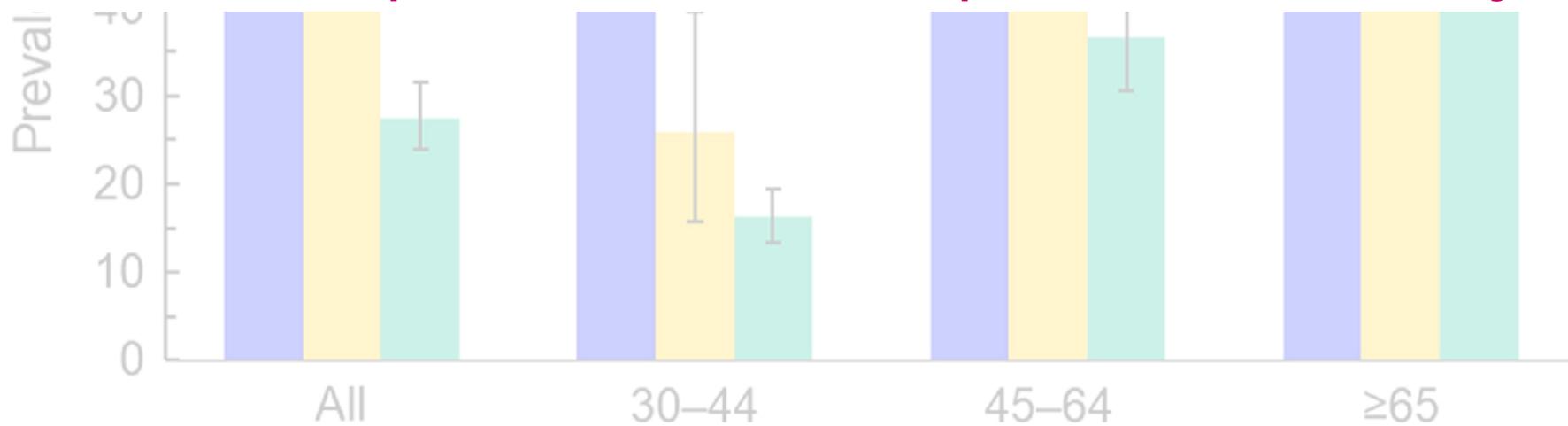
Prévalence de la parodontite



Prévalence de la parodontite



La maladie parodontale est la sixième complication du diabète; surtout lorsque le diabète n'est pas contrôlé de façon appropriée



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ORIGINAL ARTICLE

Gingival crevicular fluid biomarkers in type 1 diabetes mellitus: A case-control study*

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¹Division of Regenerative Dentistry and Periodontology, University Clinic of Lausanne, Switzerland

²Endodontics Unit, University Hospital of Geneva, Geneva, Switzerland

*Correspondence:

Hélène Léonie de Pelsmacker,
Universitätz Klinik für Zahnlärae,
1211 Geneva, Switzerland

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Abstract
Objective. The aim of the study is to compare the levels of Gingival Crevicular Fluid (GCF) Interleukin-8 (IL-8; matrix metalloproteinase-8 (MMP-8) and advanced glycation end-products (AGEs) in a cohort of type 1 diabetic (T1D) subjects and healthy controls.

Materials and methods. GCF samples and periodontal biomarker were assessed in 50 subjects with T1D (30 males and 20 females; mean age: 35.2 years) recruited from the Diabetes Unit of the Geneva University Hospitals and 50 non-diabetic subjects (mean age: 35.2 years). The following markers were assessed for IL-8 and MMP-8 using a bead array multiplex detection system and for AGEs by ELISA.

The two groups were compared using the Wilcoxon signed rank test and Student's t-test for differences between the groups (33% for the T1D group vs. 53% for the control group, $p = 0.001$). T1D subjects had significantly more plaque and gingivitis and presented more sites with bleeding on probing compared to the control group. The levels of IL-8, IL-8/MMP-8 and AGEs did not differ significantly between the groups. Furthermore, no GCF markers in younger (<40 years) and older (>40 years) cohorts revealed no significant differences between younger diabetics and controls or between older diabetics and controls.

Conclusion. No significant difference was detected according to the age of the subjects (younger and older) and no significant difference could be identified for all the biochemical markers.

Keywords: GCF, gingival crevicular fluid; IL-8; MMP-8; periodontal disease; type 1 diabetes





TABLE 1 Characteristics of the study population

	Control	Diabetic	p
Gender			1.000
Male	30 (60)	30 (60)	
Female	20 (40)	20 (40)	
Age (years), mean ± SD	35.9 (15.0)	35.2 (15.0)	0.020
HbA1c (%), mean ± SD	5.2 (0.4)	8.3 (1.8)	<0.001
Duration of diabetes (years), mean ± SD		13.3 (11.9)	
Number of complications, mean ± SD		0.6 (1.0)	

Note: The significance level for bold value is p < 0.05.

TABLE 1 Characteristics of the study population

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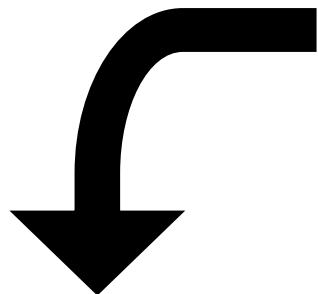
TABLE 2 Dental and biochemical parameters of the study groups

	Control	Diabetic	p
Number of teeth, mean \pm SD	26.2 (2.8)	26.8 (2.6)	0.248
PI, mean \pm SD	0.4 (0.2)	0.5 (0.4)	0.014
GI, mean \pm SD	0.4 (0.4)	1.1 (0.7)	<0.001
BOP, mean \pm SD	29.4 (16.4)	40.5 (22.2)	0.009
PD, mean \pm SD	2.5 (0.3)	2.5 (0.4)	0.381

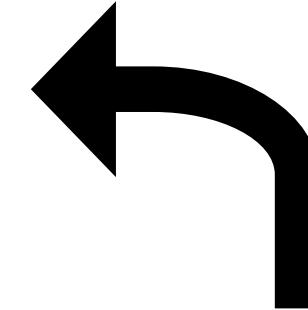
Les sujets atteints de diabète de type 1 présentaient significativement plus de plaque et d'inflammation gingivale, comparés aux témoins



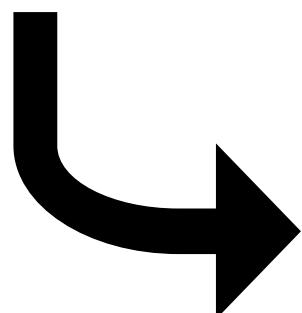
Parodontite



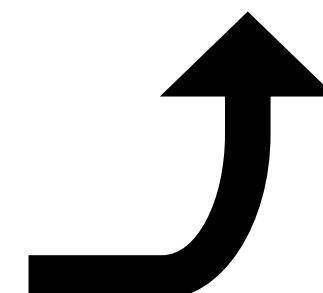
↓ Contrôle du sucre sanguin



Réaction immunitaire,
Microcirculation entravée



Diabète renforcé



- *Effect of periodontal disease on diabetes: systemic review on epidemiological observational evidence Borgnakke et al, JP 2013*
- *Scientific evidence on the links between periodontal diseases and diabetes : Consensus report and guidelines of the joint workshop on periodontal disease and diabetes by the International Diabetes Federation and the European Federation of Periodontology ,Sanz et al 2017*

Parodontite et diabète

- Communauté indienne Pima
- Parodontite évaluée cliniquement et radiographiquement en BL

➤ Résultats:

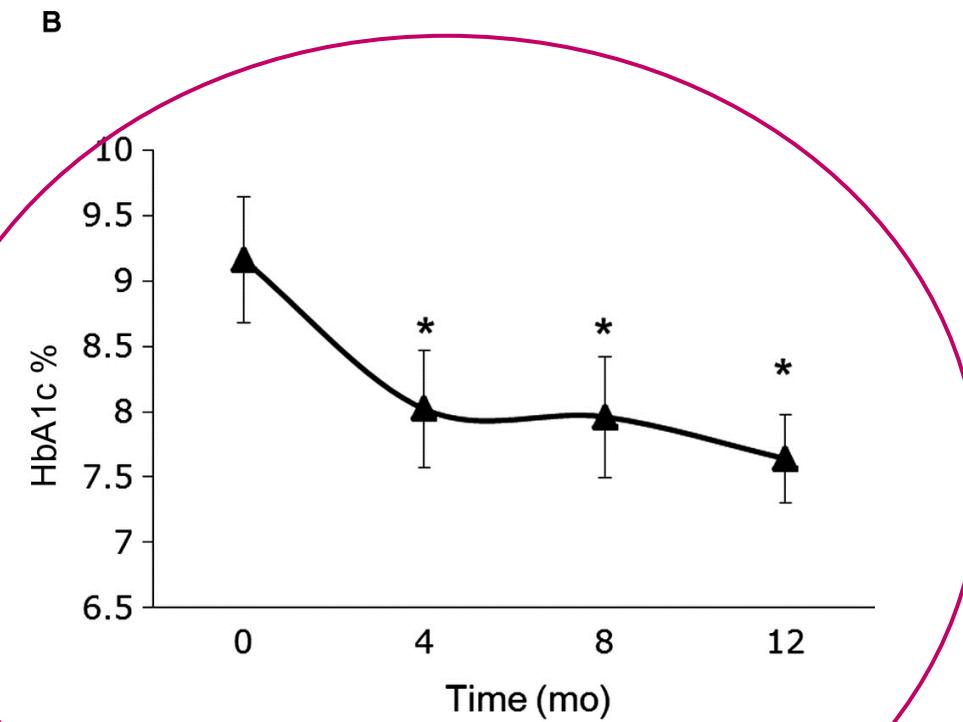
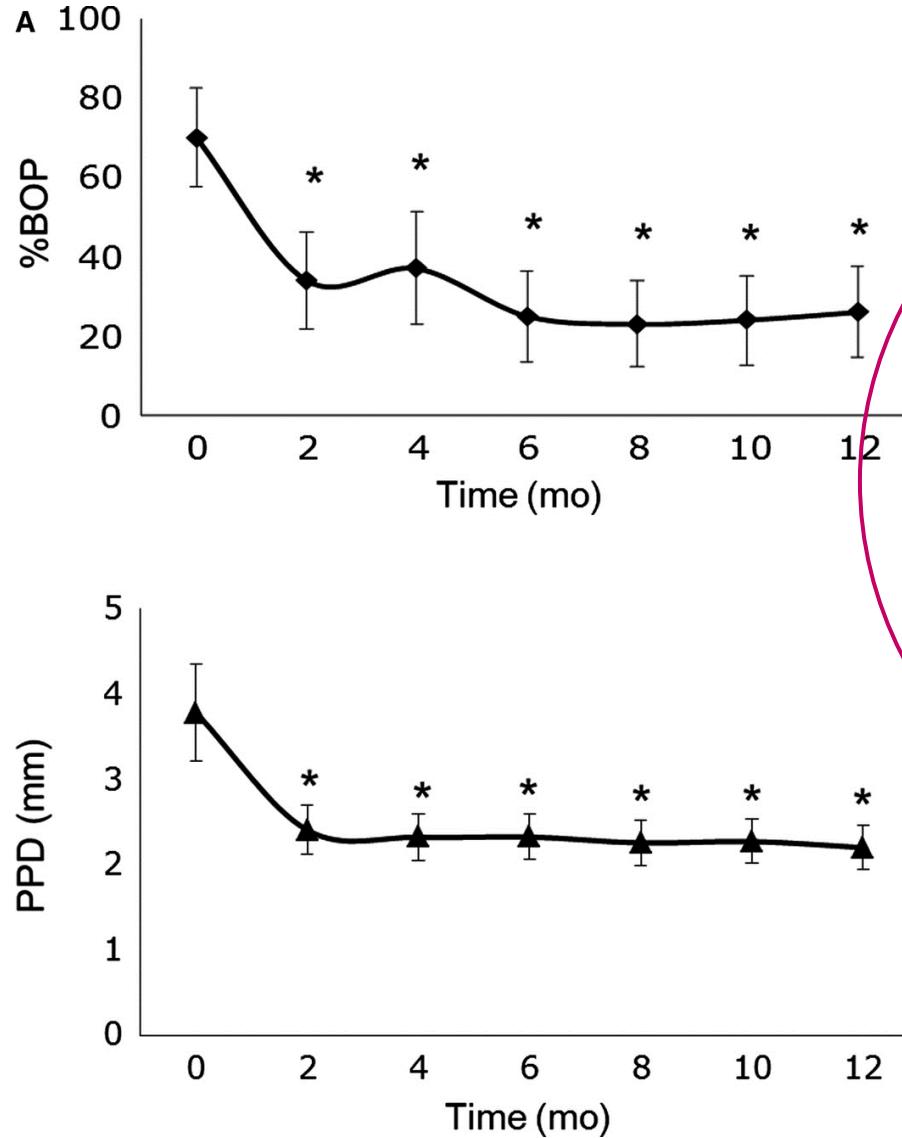
Parodontite sévère en BL associée à:

✓ un mauvais contrôle métabolique (HBA1c>9%) à 4 ans

✓ 3.2 plus de risque de mortalité d'origine cardiaque



Effet du traitement parodontal



Réduction de HbA1c de 1.3
± 0.7% à 12 mois



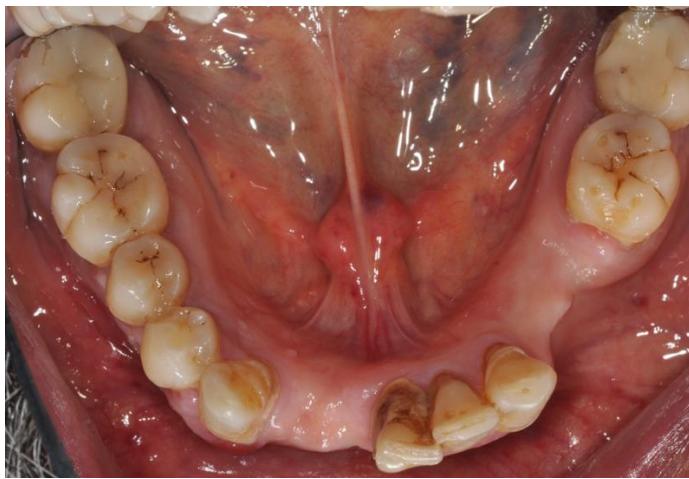


Questions	Endocrinologists (n=23)	General health physicians (n=98)	P value	Total (n=121)
It would be important to make doctors aware during their training of the relationship between diabetes mellitus and periodontal disease				
Agree	21 (91.3%)	93 (94.9%)	0.426	114 (94.2%)
Disagree	0	1 (1%)		1 (0.8%)
Unsure	2 (8.7%)	4 (4.1%)		6 (5%)
No answer	0	0		0
Doctors should be made aware of the symptoms of periodontal disease				
Agree	21 (91.3%)	93 (94.9%)	0.707	114 (94.2%)
Disagree	0	1 (1%)		1 (0.8%)
Unsure	2 (8.7%)	4 (4.1%)		6 (5%)
No answer	0	0		0
I need more information on periodontal disease and its impact on diabetes				
Agree	21 (91.2%)	88 (89.8%)	0.913	109 (90%)
Disagree	1 (4.4%)	5 (5.1%)		6 (5%)
Unsure	1 (4.4%)	5 (5.1%)		6 (5%)
No answer	0	0		0
Doctors should be trained to screen their diabetic patients for periodontal disease				
Agree	17 (74%)	83 (84.7%)	0.107	100 (82.6%)
Disagree	3 (13%)	3 (3.1%)		6 (5%)
Unsure	3 (13%)	11 (11.2%)		14 (11.6%)
No answer	0	1 (1%)		1 (0.8%)
I want to include oral health screening in my practice				
Agree	18 (78.3%)	78 (79.6%)	0.841	96 (79.3%)

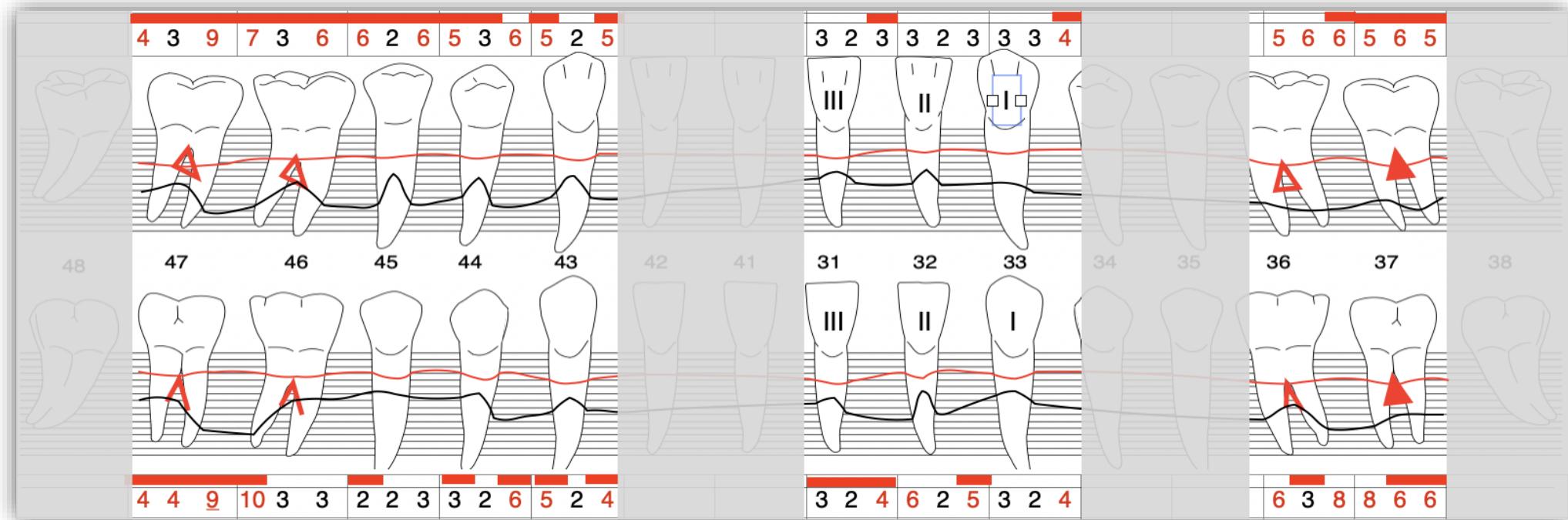
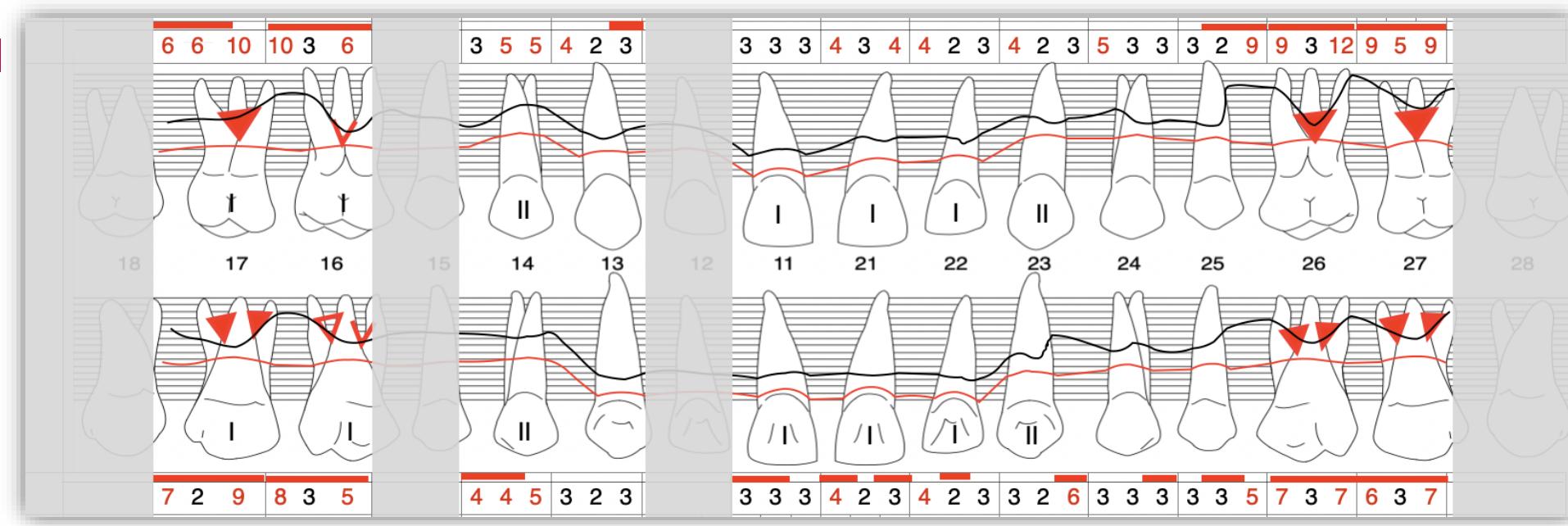


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I want to include oral health screening in my practice				
Agree	18 (78.3%)	78 (79.6%)	0.841	96 (79.3%)

Patient diabétique
HbA1 >7



Status initial



BOP 53%
PS 100%



Examen radiologique initial



2 ^e réév.	08.02.2023	3 2 4	3 3 3	3 2 3 3 2 3	3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3
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ROUGE: saignement

furcations

poches > 3mm

vitalité -

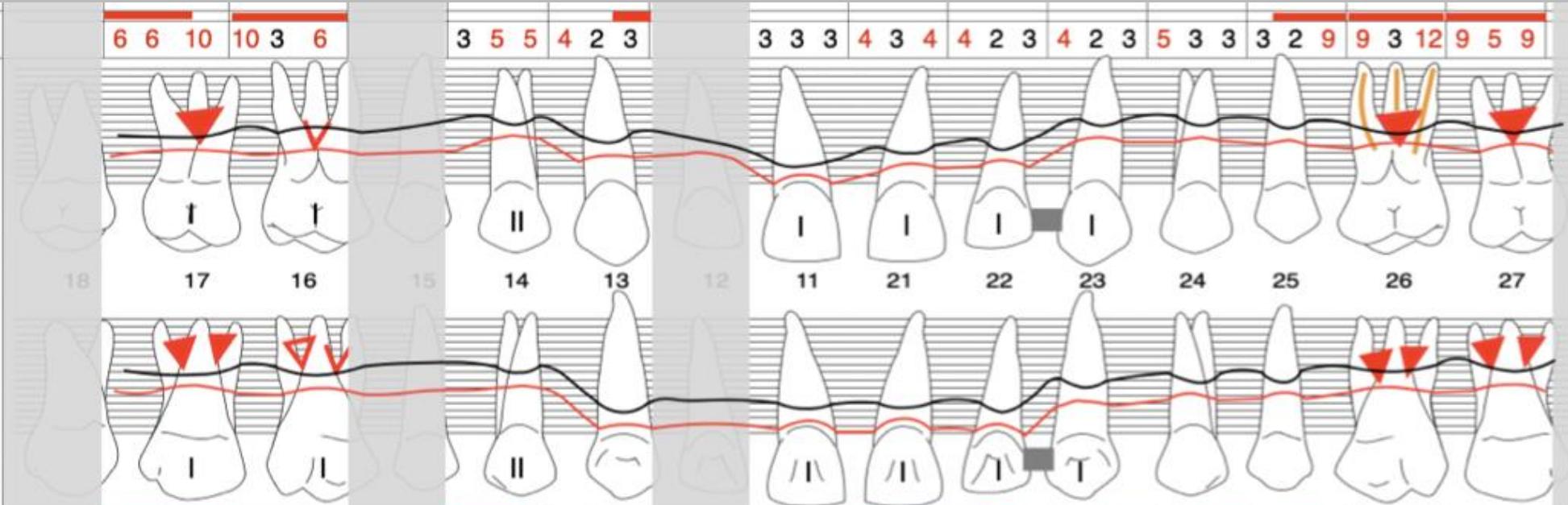
niveau gingiv.

NOIR: mobilités

I,II,III,IV

foyers endo.

niveau os



Ex. initial	25.09.2020	7 2 9	8 3 5	4 4 5	3 2 3	3 3 3 4 2 3 4 2 3 3 2 7 3 3 3 3 3 5 7 3 7 10 3 7
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2 ^e réév.	08.02.2023	3 2 4	4 3 4	3 2 3 3 2 3	3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 4 3 4 4 3 4
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2^e réév.

08.02.2023

Ex. initial 25.09.2020

ROUGE: saignement

furcations

poches > 3mm

vitalité -

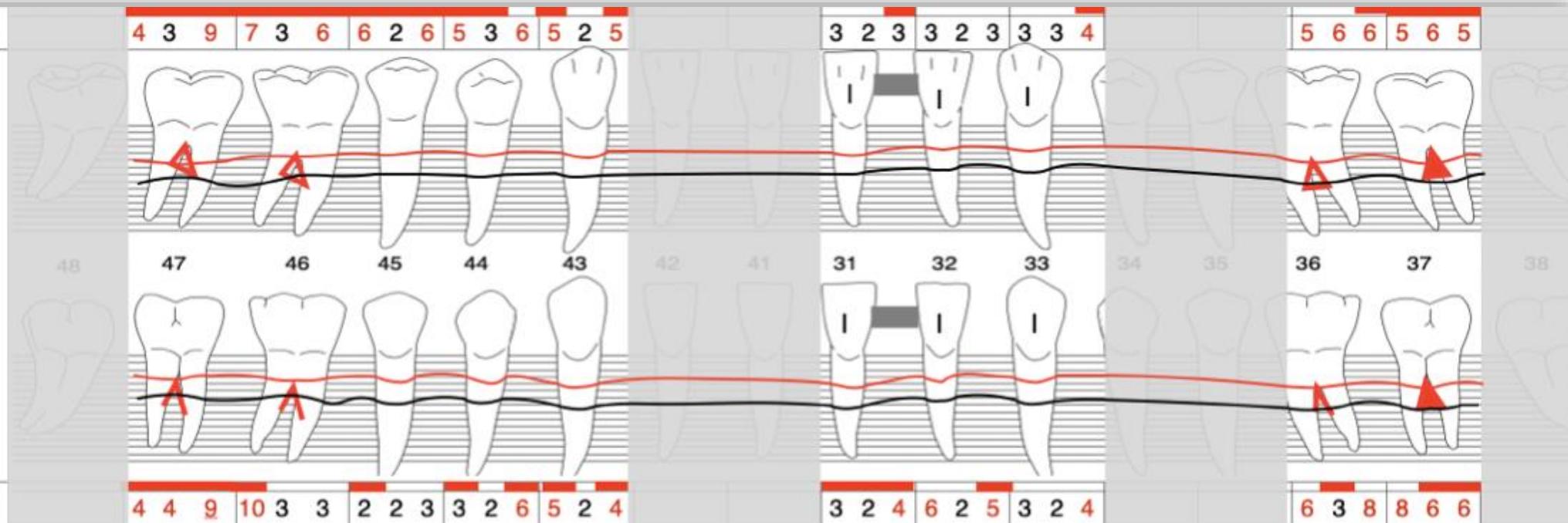
niveau gingiv

NOIR: mobilités

LILJELAND

foyers endo

niveau os



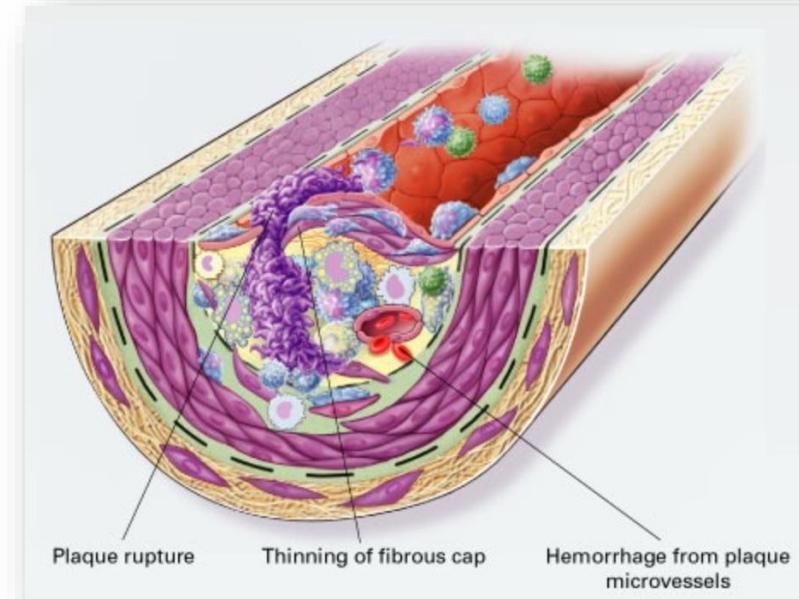
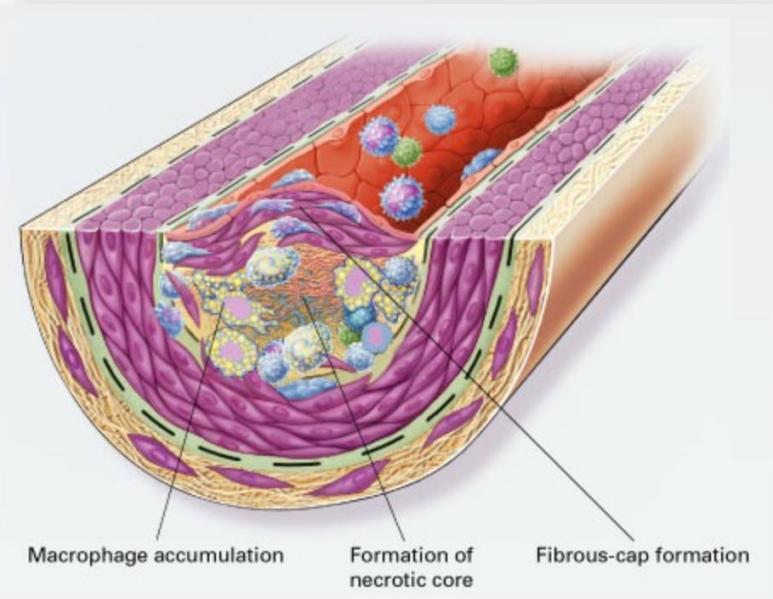
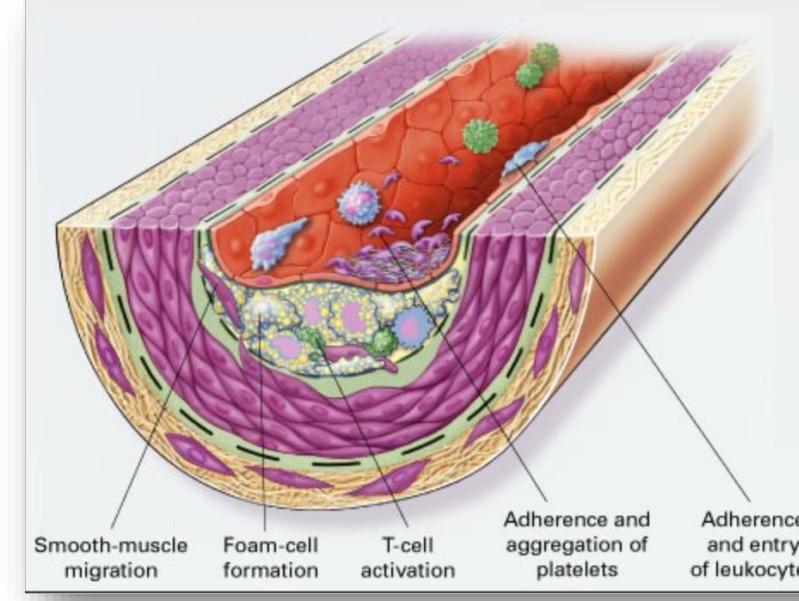
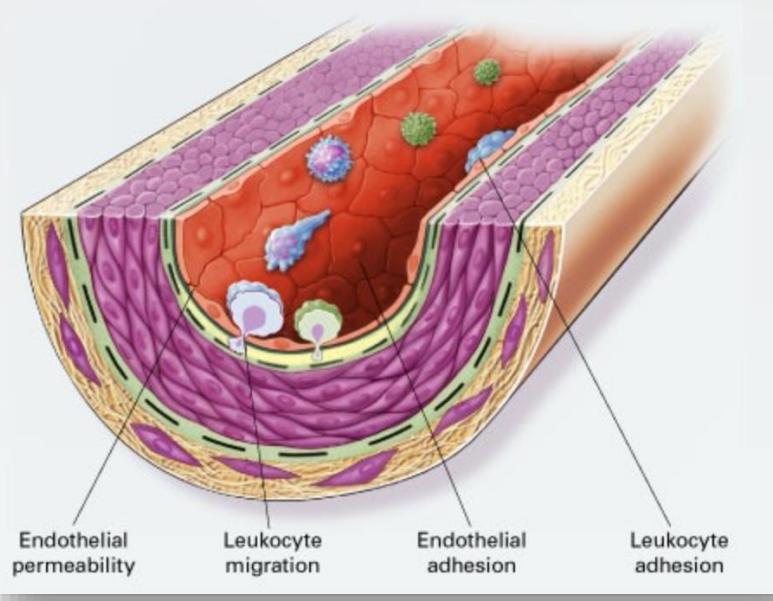
2e réévy.

08.02.2023





Maladie Cardiovasculaire



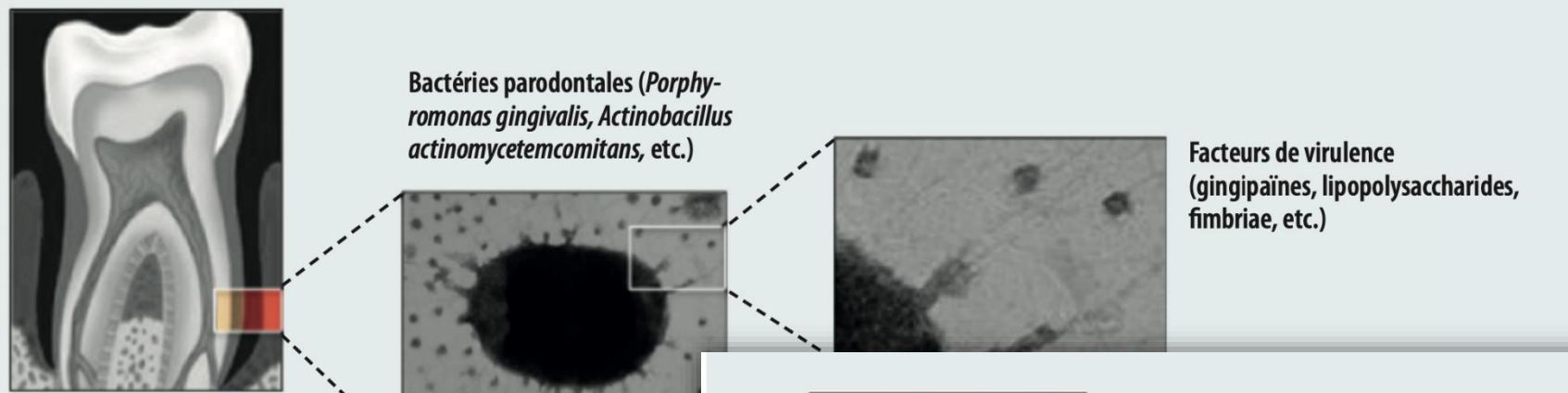


Figure 4. Mécanismes directs de l'aggravation de la maladie athéromateuse

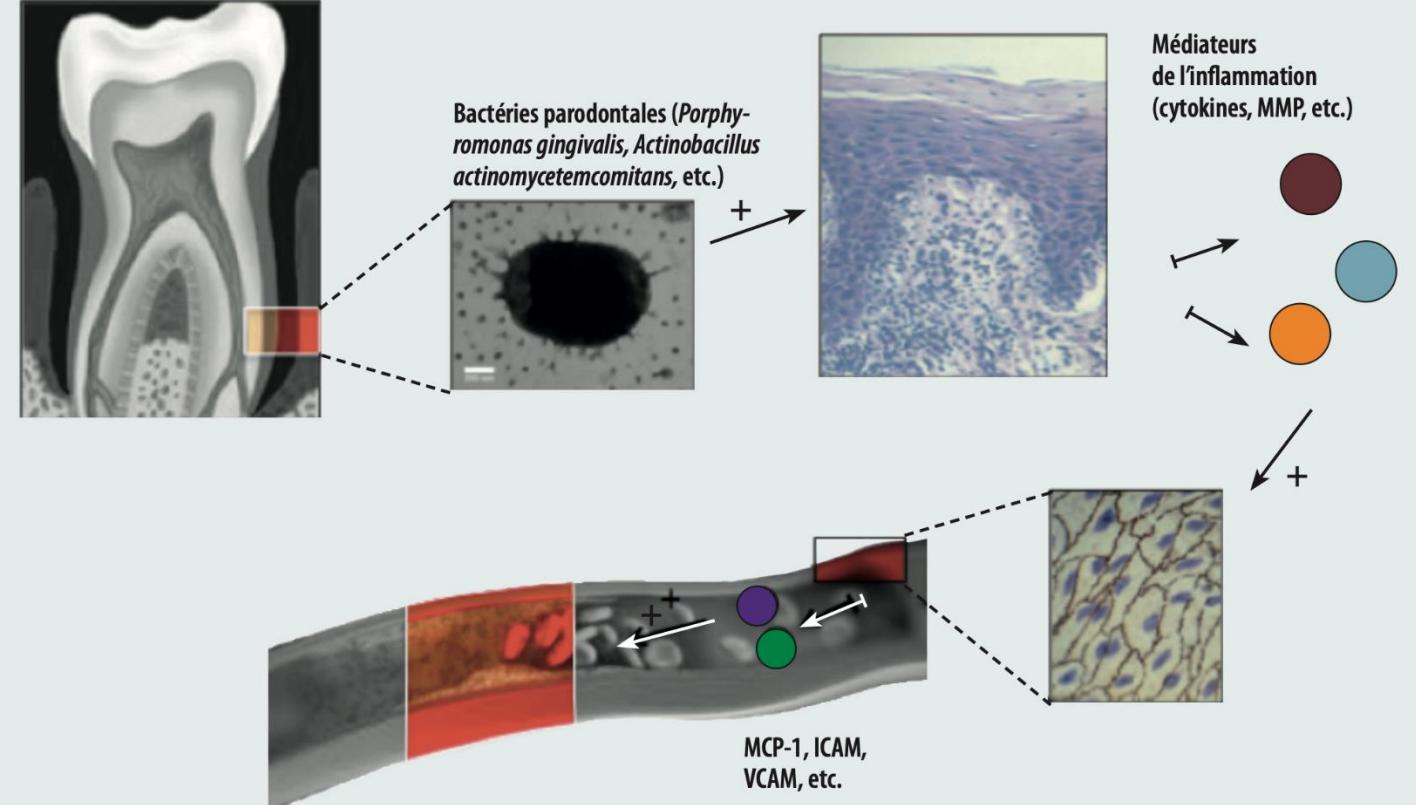


Figure 5. Mécanismes indirects de l'aggravation de la maladie athéromateuse par la parodontite.



Parodontite et maladie cardiovasculaire

Revue systématique

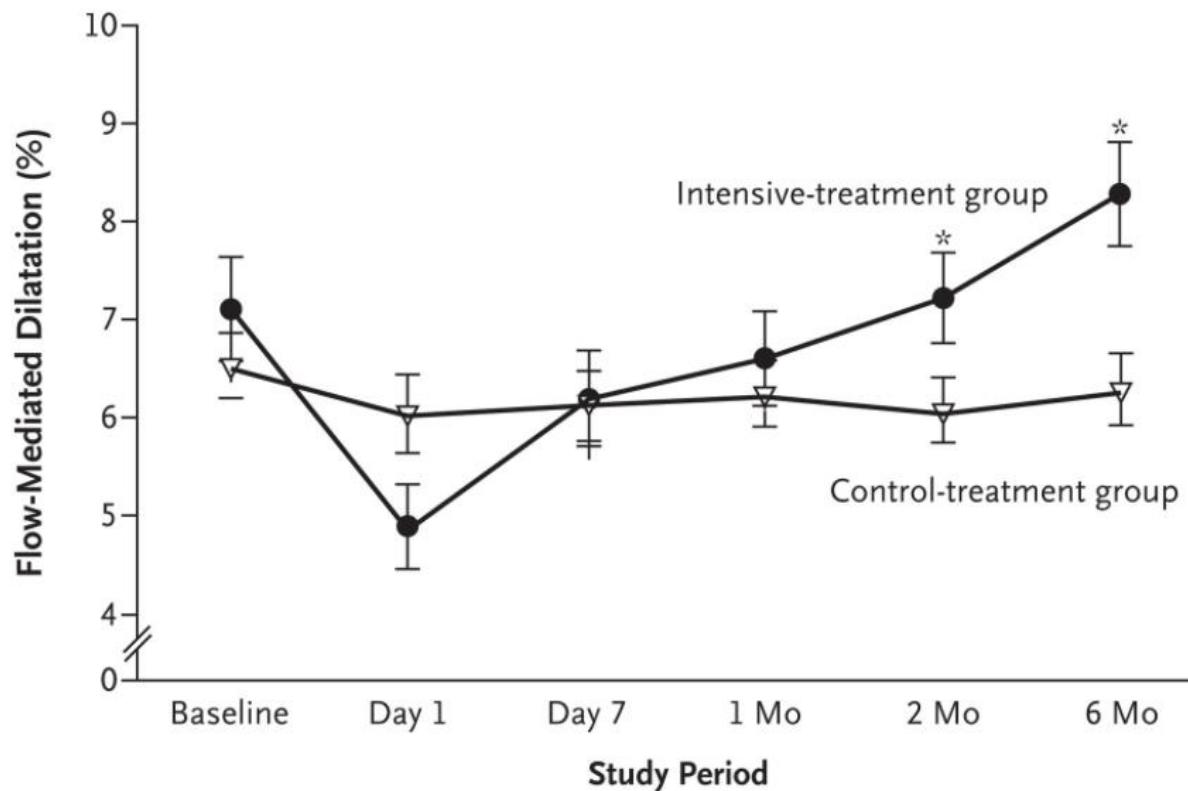
But : rechercher les études montrant une association entre P et maladies CV

Conclusion : il existe une évidence pour un risque augmenté du développement de l'athérosclérose chez les patients avec maladie parodontale comparé aux patients parodontalement sains

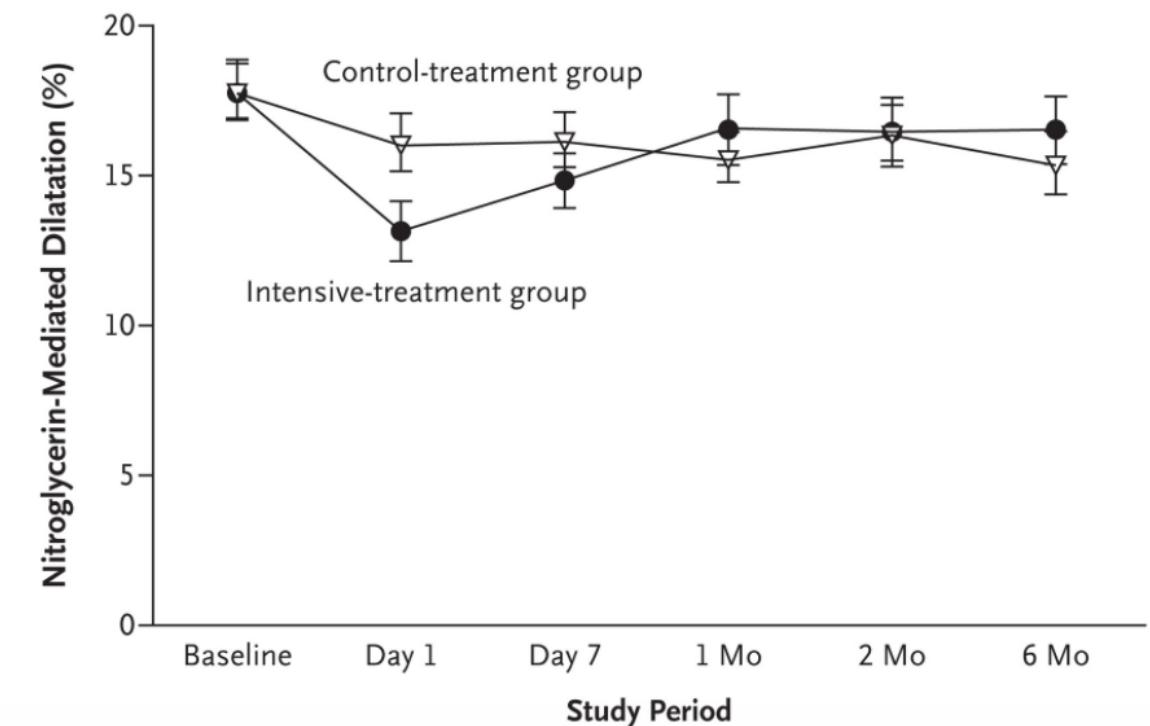


Bénéfices du traitement parodontal sur marqueurs de risque de maladies CV

A



B





Conclusions...

- Risque statistiquement augmenté d' ACVD chez les individus souffrant de parodontite, indépendamment des facteurs de risque CV
- Variations du risque avec l'âge
- Evidence modérée concernant les effets des traitements parodontaux

Syndrome métabolique et obésité



Le poids de l'obésité sur les systèmes de santé

Estimation des dépenses annuelles de santé liées à l'obésité par habitant entre 2020 et 2050 *



plus de 50 %
de la population est en
surpoids ou obèse



plus de 20 %
de la population est
obèse

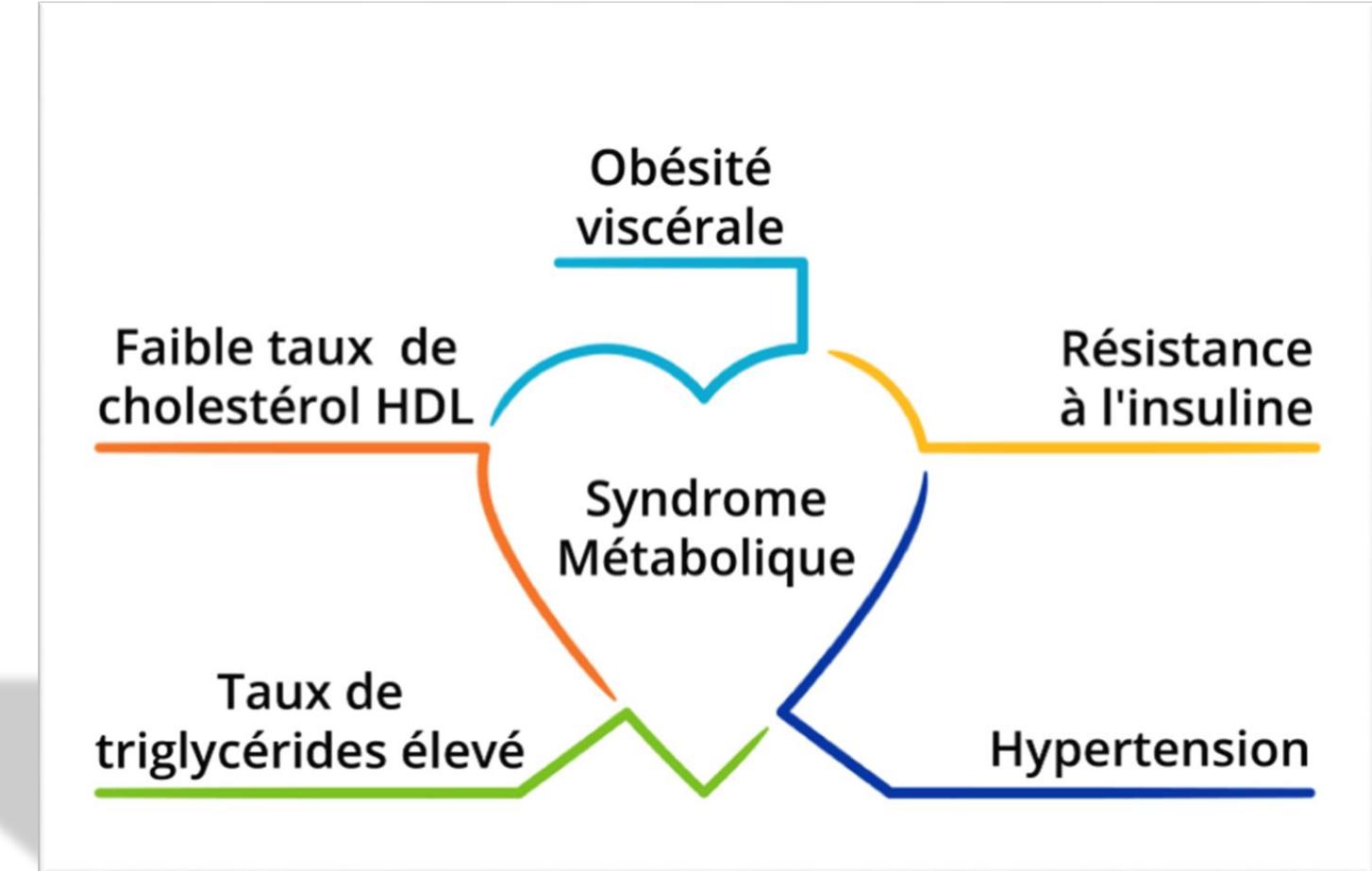
Syndrome métabolique

➤ Obésité abdominale

+

➤ 2 de ces 4 facteurs

- ✓ Hypertension
- ✓ Hyperglycémie
- ✓ HDL réduits
- ✓ Niveaux élevés de triglycérides



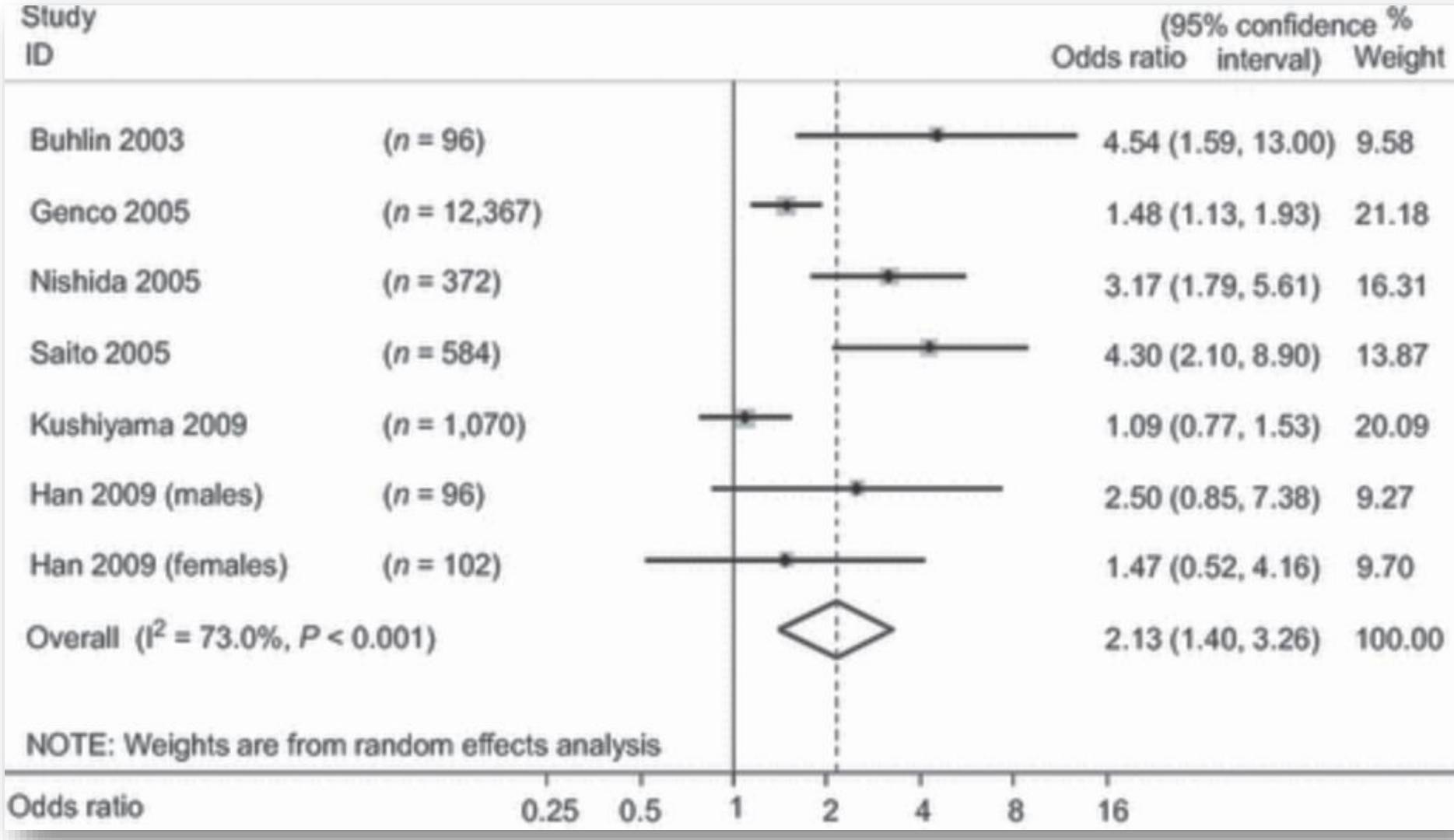


Obésité : Effets sur le parodonte

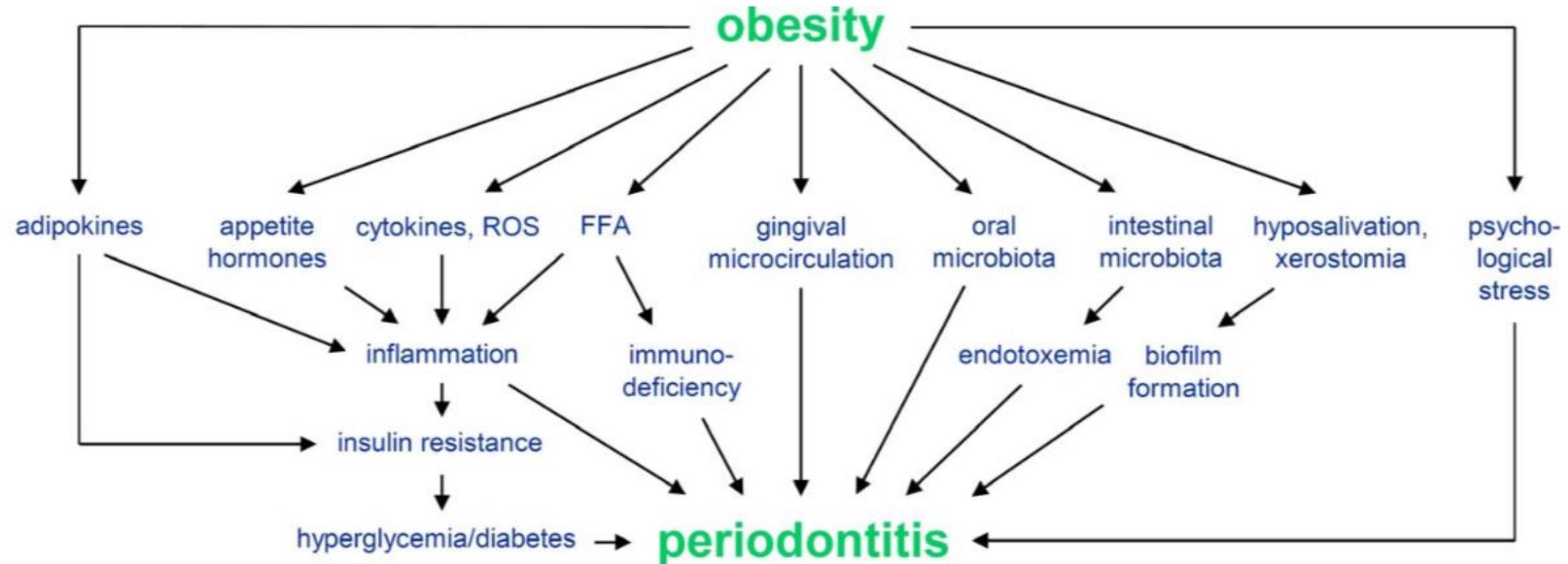
- HR femme > HR homme
- BMI > 25
- BMI > 30, association avec parodontite aussi forte qu'avec le tabac



Obésité : Effets sur le parodonte



Obésité : Effets sur le parodonte



HTA et parodontite

- Association bidirectionnelle
- Patients avec une parodontite 20% de plus de risque de développer de l'hypertension
- Plus sévère est la parodontite, plus élevée est l'hypertension







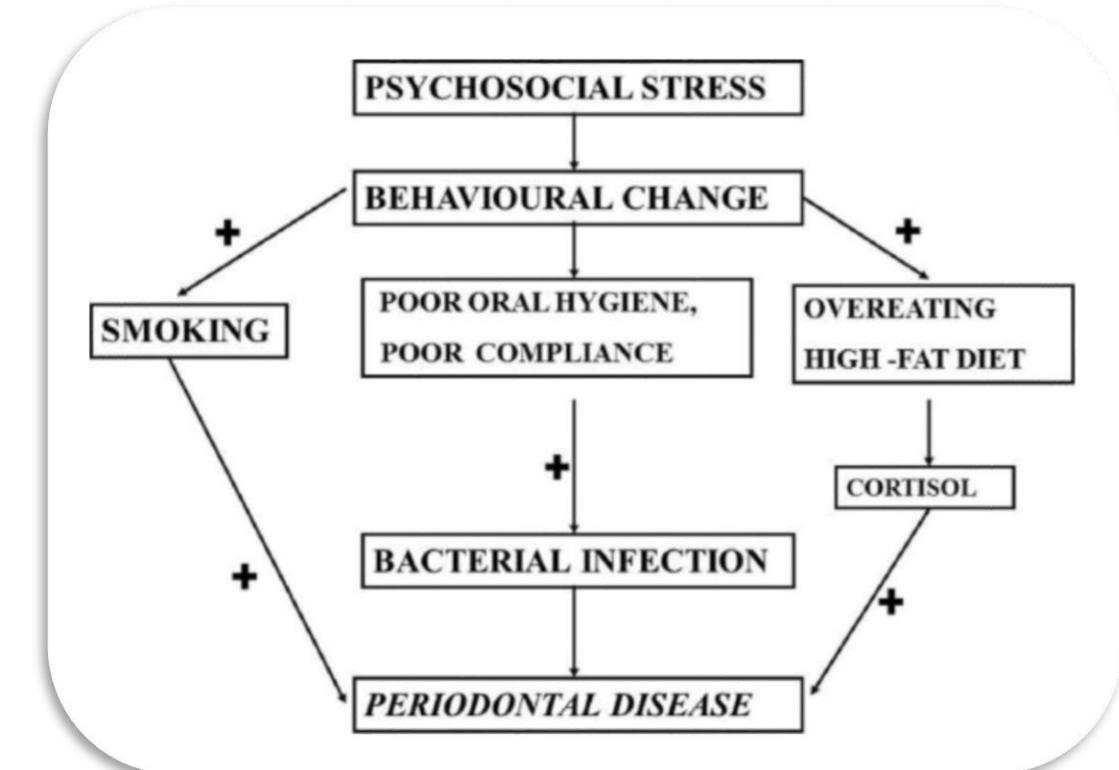
Stress

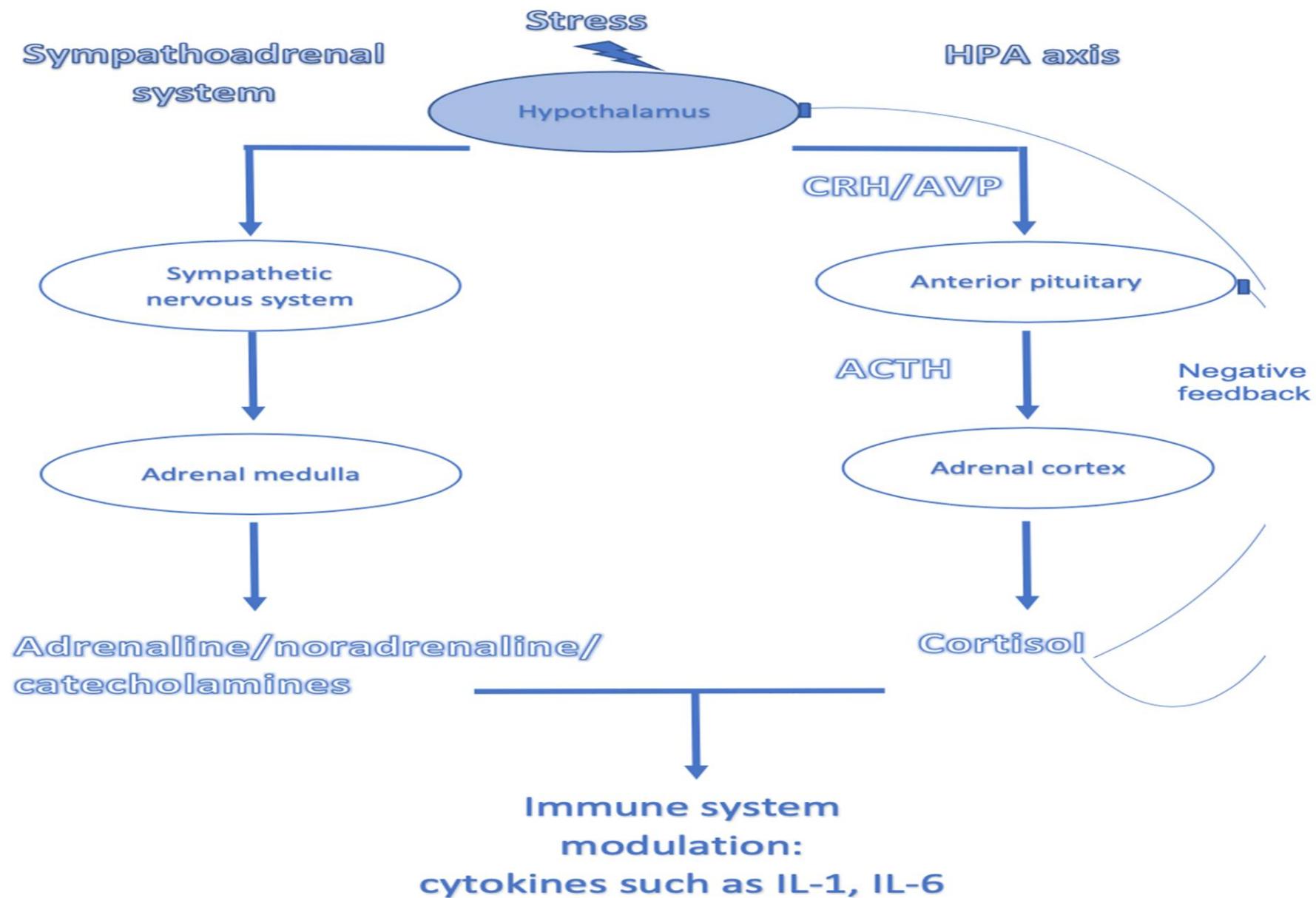


**LE STRESS
EST
UN TUEUR
SILENCIEUX**

Répercussions du stress sur le parodonte

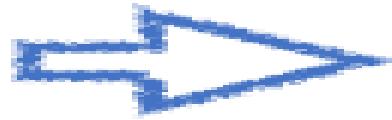
- **Directe**, effet sur composants vasculaire/cellulaire/cicatrisation
- **Indirecte**, favorise apparition et développement d'autres facteurs de risque





Stress: Effets sur la thérapie parodontale

- Association comportement défensif d'adaptation face au stress et moins bon **gain d'attache et cicatrisation parodontale**



Prise en charge **multidisciplinaire**



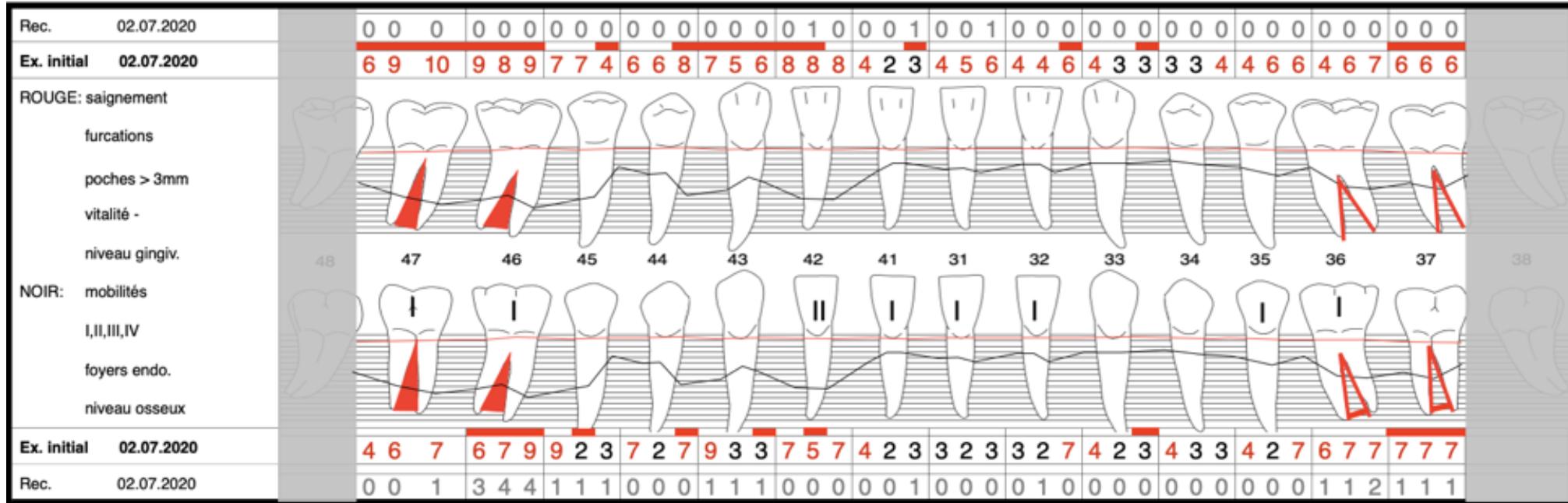
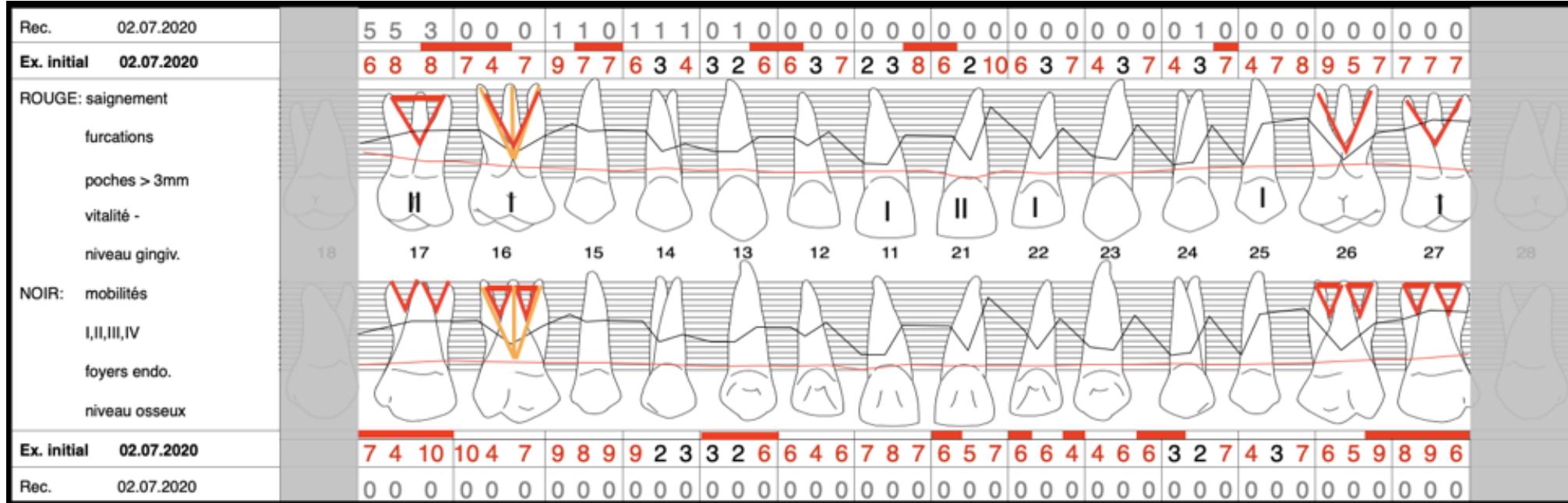


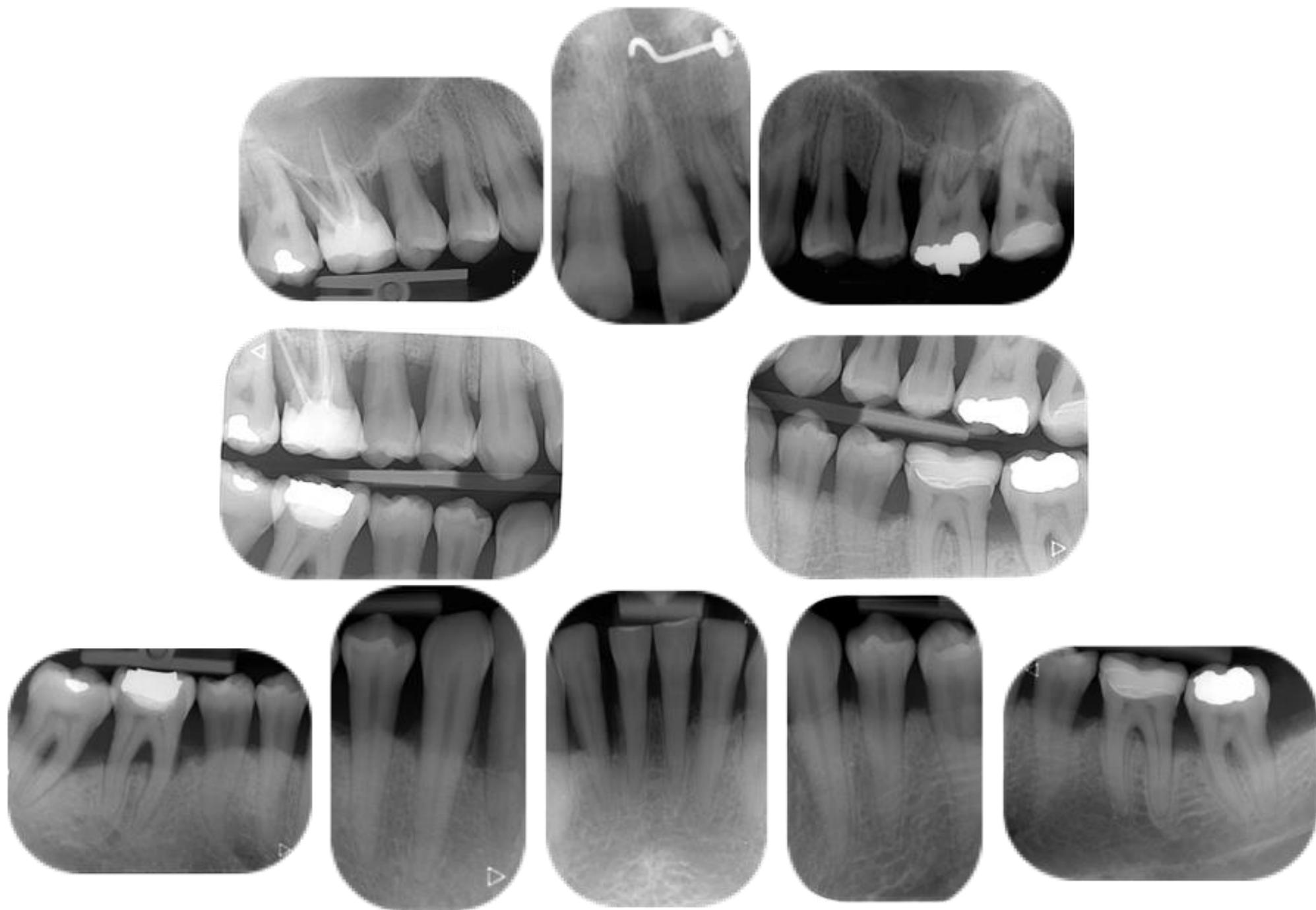
Dépression et parodontite



Pati^ente dépressive











Rec.	31.01.2023	6 5 3 1 0 0 0 1 0 1 1 0 0 0 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 1 6
4 ^e réév.	31.01.2023	3 3 4 4 3 4 3 3 4 3 2 3 2 2 3 3 1 3 2 2 3 1 2 1 3 2 4 2 2 4 2 2 3 3 3 4 3 2 3 3 3 3
Rec.	02.07.2020	5 5 3 0 0 0 1 1 0 1 1 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0
Ex. initial	02.07.2020	6 8 8 7 4 7 9 7 7 6 3 4 3 2 6 6 3 7 2 3 8 6 2 10 6 3 7 4 3 7 4 3 7 4 7 8 9 5 7 7 7 7
ROUGE: saignement furcations poches > 3mm vitalité - niveau gingiv.		
NOIR: mobilités I,II,III,IV foyers endo. niveau osseux		
Ex. initial	02.07.2020	7 4 10 10 4 7 9 8 9 9 2 3 3 2 6 6 4 6 7 8 7 6 5 7 6 6 4 4 6 6 3 2 7 4 3 7 6 5 9 8 9 6
Rec.	02.07.2020	0 0
4 ^e réév.	31.01.2023	3 3 4 4 3 4 4 3 4 2 2 3 2 1 3 3 1 2 3 3 3 3 2 4 2 2 3 2 2 3 1 1 3 3 3 3 4 2 4 4 2 4
Rec.	31.01.2023	0 0

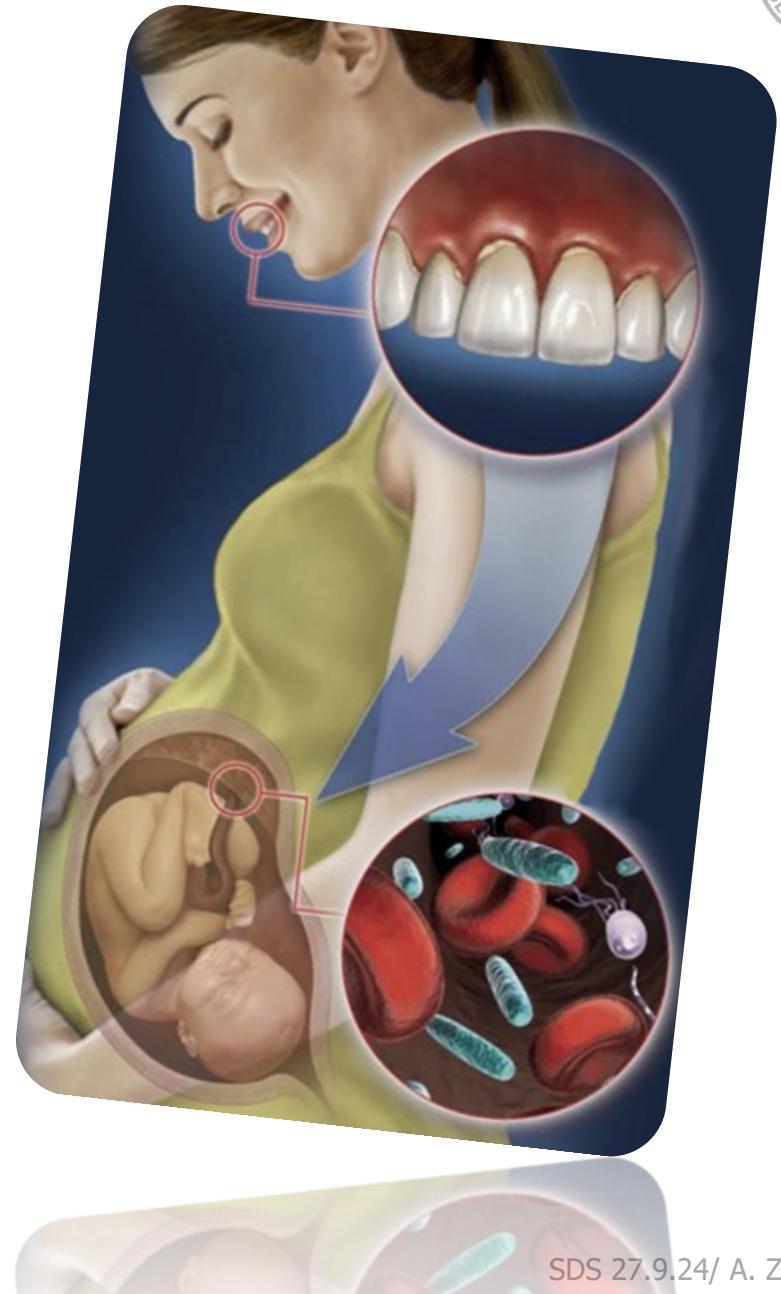
Rec.	31.01.2023	0 0
4 ^e réév.	31.01.2023	2 3 4 3 4 4 3 2 3 3 1 3 3 2 2 3 2 2 3 1 1 3 1 2 1 2 2 2 2 2 1 2 3 3 2 3 3 3 3 3 4
Rec.	02.07.2020	0 0
Ex. initial	02.07.2020	6 9 10 9 8 9 7 7 4 6 6 8 7 5 6 8 8 8 4 2 3 4 5 6 4 4 6 4 3 3 3 3 4 4 6 6 4 6 7 6 6 6
ROUGE: saignement furcations poches > 3mm vitalité - niveau gingiv.		
NOIR: mobilités I,II,III,IV foyers endo. niveau osseux		
Ex. initial	02.07.2020	4 6 7 6 7 9 9 2 3 7 2 7 9 3 3 7 5 7 4 2 3 3 2 3 3 2 7 4 2 3 4 3 3 4 2 7 6 7 7 7 7 7
Rec.	02.07.2020	0 0 1 3 4 4 1 1 1 0 0 0 1 1 1 0 0 0 0 0 1 0 0 0 0 1 0
4 ^e réév.	31.01.2023	3 3 3 3 3 3 2 2 3 2 2 3 2 2 3 1 1 3 1 2 3 2 3 3 2 3 3 2 3 3 2 3 4 3 3
Rec.	31.01.2023	0 1 1 5 5 4 1 1 1 0 0 0 1 1 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 2 2 2 1 1 1

Facteurs hormonaux



Complications de la grossesse

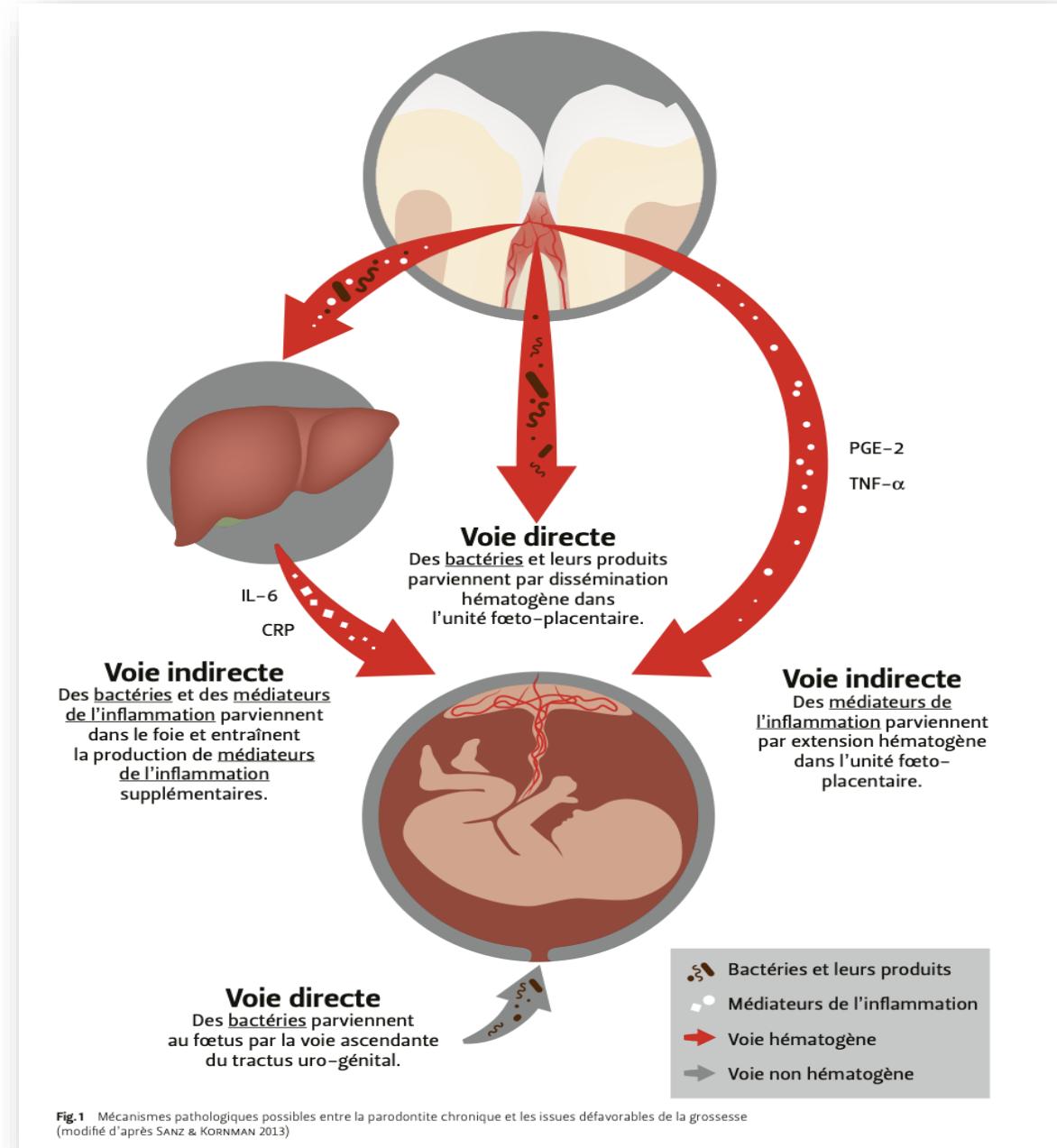
- Prématurité (PTB) : naissance avant 37 semaines
- Grande prématurité : naissance avant 32 semaines
- Faible poids de naissance (LBW) : <2500g
- Très faible poids de naissance (VLBW) : <1500g
- Fausse couche
- Pré-éclampsie
- Diabète gestationnel



Grossesse: Effets sur le parodonte

Tab. I Résultats des 6 études incluses sur la prééclampsie

Étude	Résultats
(PRALHAD ET COLL. 2013)	<ul style="list-style-type: none"> - 88 % des femmes enceintes souffrant d'hypertension artérielle avaient une parodontite et seulement 43 % des femmes normotendues avaient une parodontite ($p < 0,0001$) - Risque relatif 1,5 (IC 95 % : 1,3-1,9) - Odds ratio 5,5 (IC 95 % : 0,7-33,7)
(CHAPARRO ET COLL. 2013)	<ul style="list-style-type: none"> - <i>T. denticola</i> ($p = 0,001$, odds ratio 9,39, IC 95 % : 2,39 à 36,88) et <i>P. gingivalis</i> ($p = 0,019$; odds ratio 7,59; IC 95 % : 1,39 à 41,51) étaient plus fréquents dans les placentas des femmes enceintes présentant une prééclampsie - Significativité positive ($p = 0,04$) de l'expression des récepteurs de type Toll chez les femmes atteintes de prééclampsie
(KUMAR ET COLL. 2014)	<ul style="list-style-type: none"> - Le taux sérique de TNF-α était significativement plus élevé chez les femmes atteintes de parodontite et de prééclampsie que chez celles présentant une bonne hygiène buccale et une prééclampsie ($p < 0,001$) - 13,54 % (39/288) des femmes atteintes de parodontite ont développé une prééclampsie, et seulement 5,55 % (12/216) des femmes sans parodontite ont développé une prééclampsie - Odds ratio 2,66 (IC 95 % : 1,32-5,73)
(VARSHNEY & GAUTAM 2014)	<ul style="list-style-type: none"> - 65 % des femmes atteintes de prééclampsie présentaient une parodontite, et seulement 30 % des femmes sans prééclampsie présentaient une parodontite ($p < 0,05$) - Odds ratio 4,33
(HA ET COLL. 2014)	<ul style="list-style-type: none"> - Odds ratio 4,51 (IC 95 % : 1,13-17,96)
(DESAI ET COLL. 2015)	<ul style="list-style-type: none"> - Une différence statistiquement significative des saignements au sondage, de la perte d'attache et des profondeurs de sondage parodontales ($p < 0,001$) a été mise en évidence entre les femmes avec et sans prééclampsie. - Odds ratio 19,8



Polyarthrite Rhumatoïde

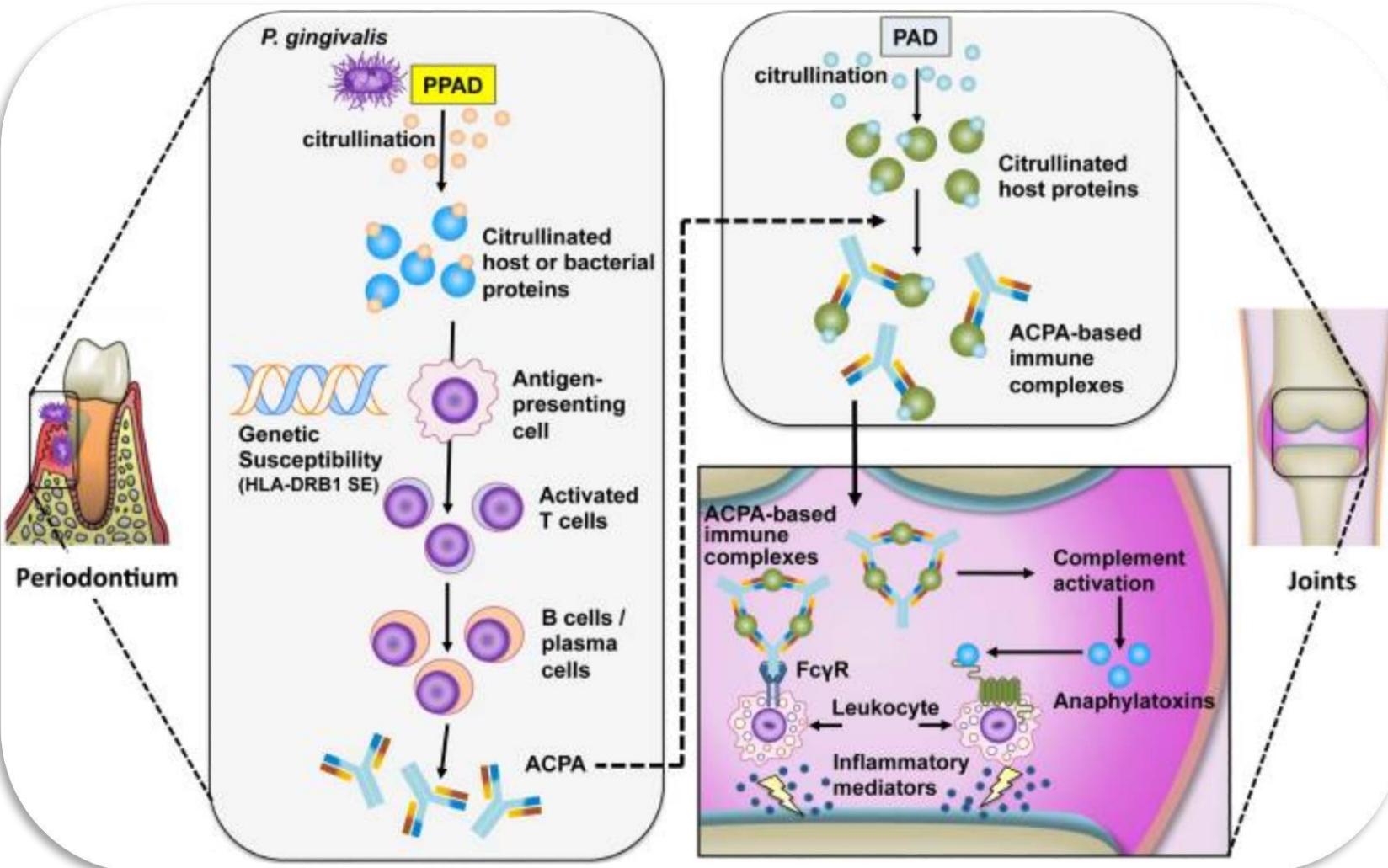




Polyarthrite Rhumatoïde

- Association bidirectionnelle qui fait débat
- Prévalence d'atteinte par parodontite modérée et sévère de 62,5% *Mercado et al 2000, Loutan et al 2019*

RA et parodontite

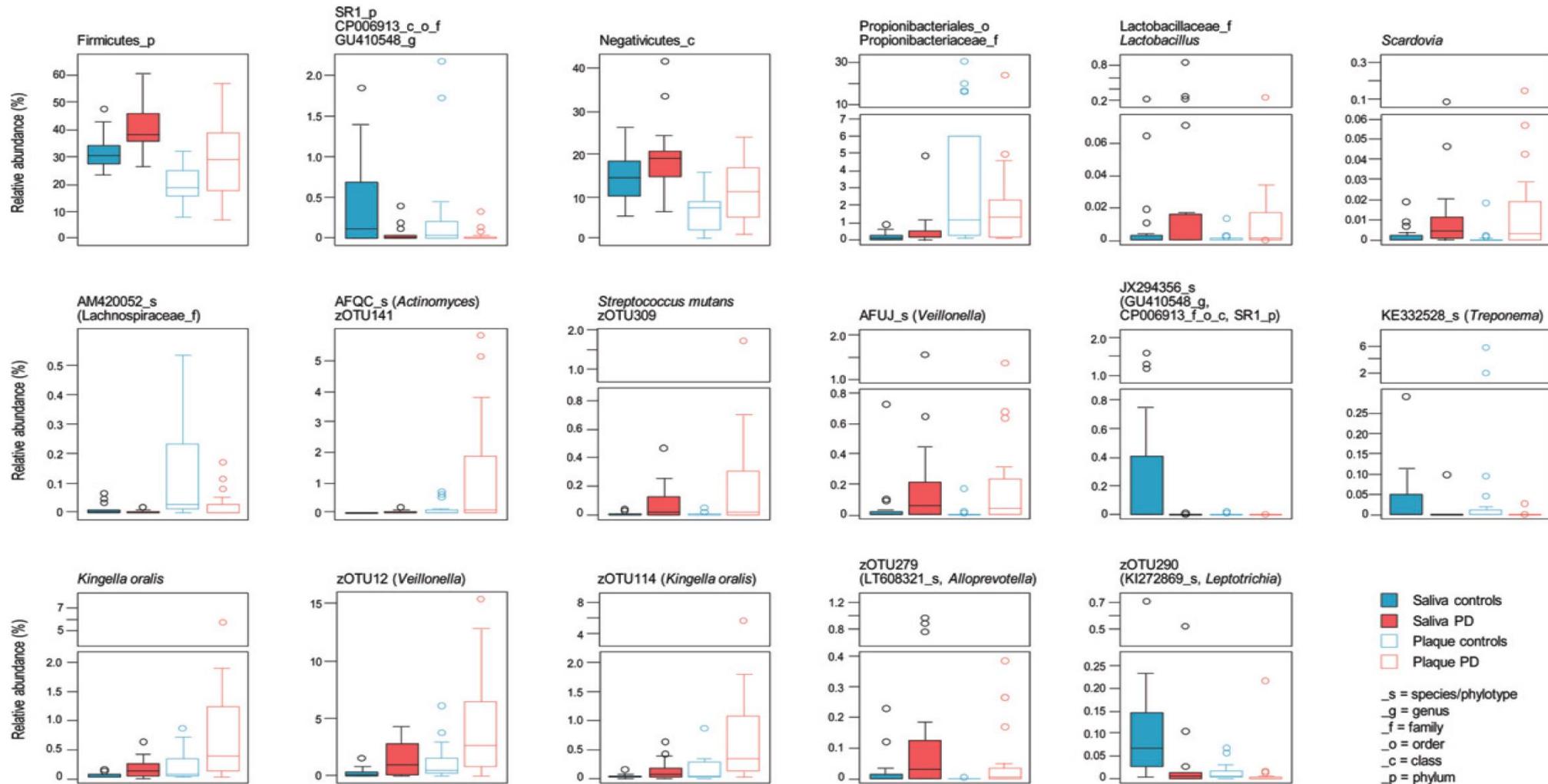


➤ *Porphyromonas gingivalis* - mediated citrullination and induction of ACPA in rheumatoid arthritis

Maladie Parodontale et Parkinson

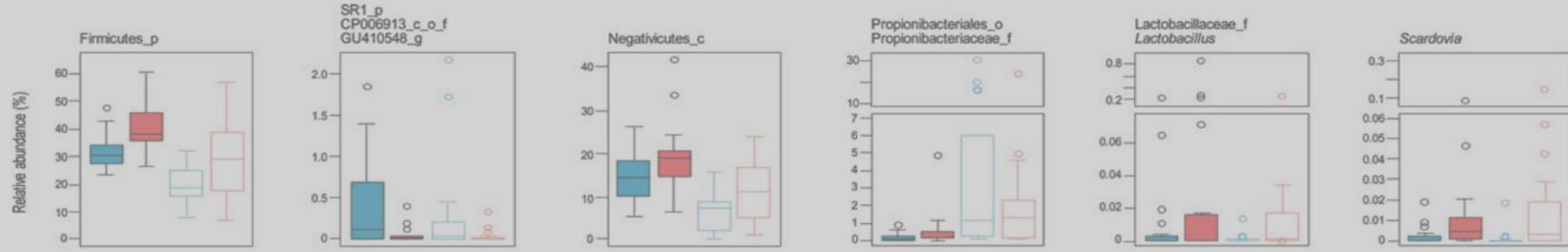


Parkinson et parodontite

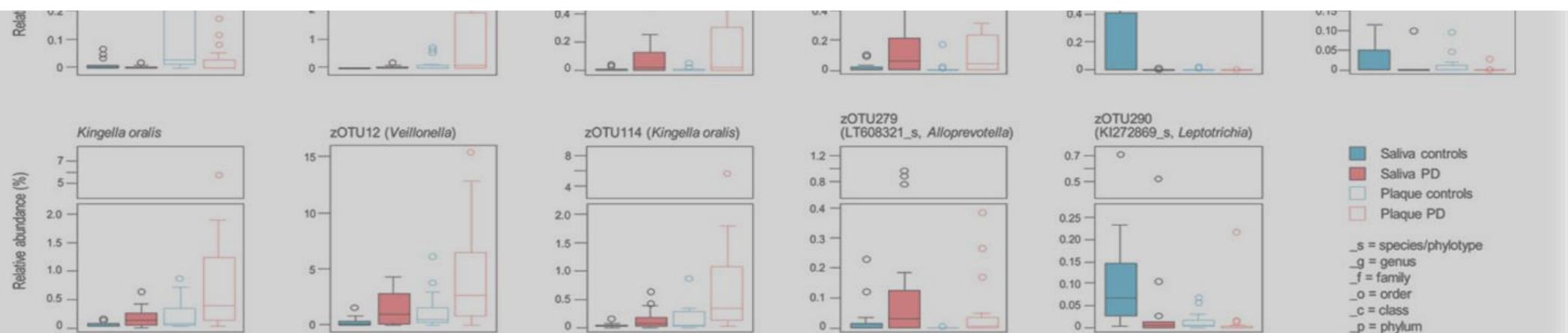


Bacterial taxa significantly different in abundance between patients and controls in both saliva and dental plaque

Parkinson et parodontite



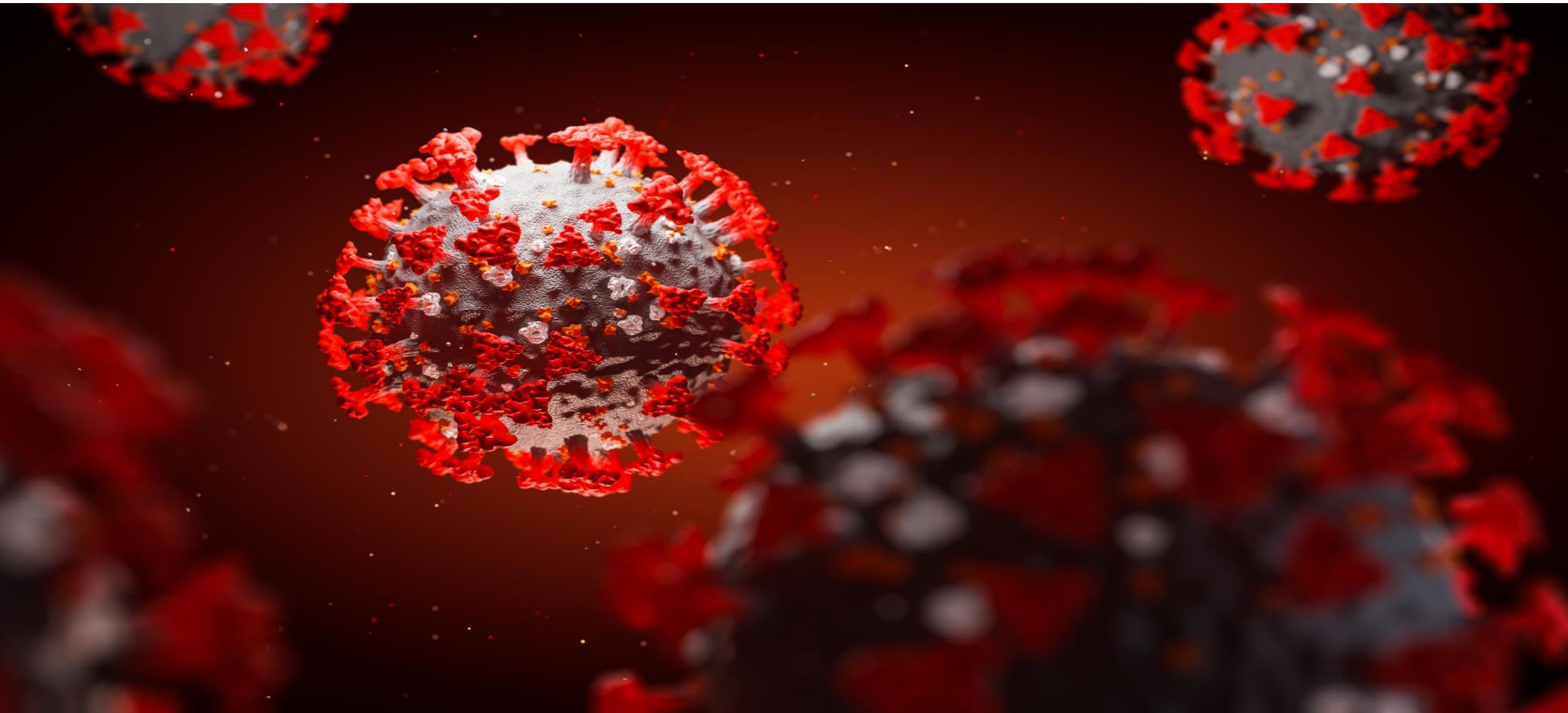
Bien que le statut bucco-dentaire clinique soit similaire entre les cas et les témoins, des différences significatives ont été observées au niveau du microbiome et de certains facteurs inflammatoires dans la GCF. Le microbiome buccal pourrait jouer un rôle dans la pathogenèse de la maladie Parkinson



Bacterial taxa significantly different in abundance between patients and controls in both saliva and dental plaque



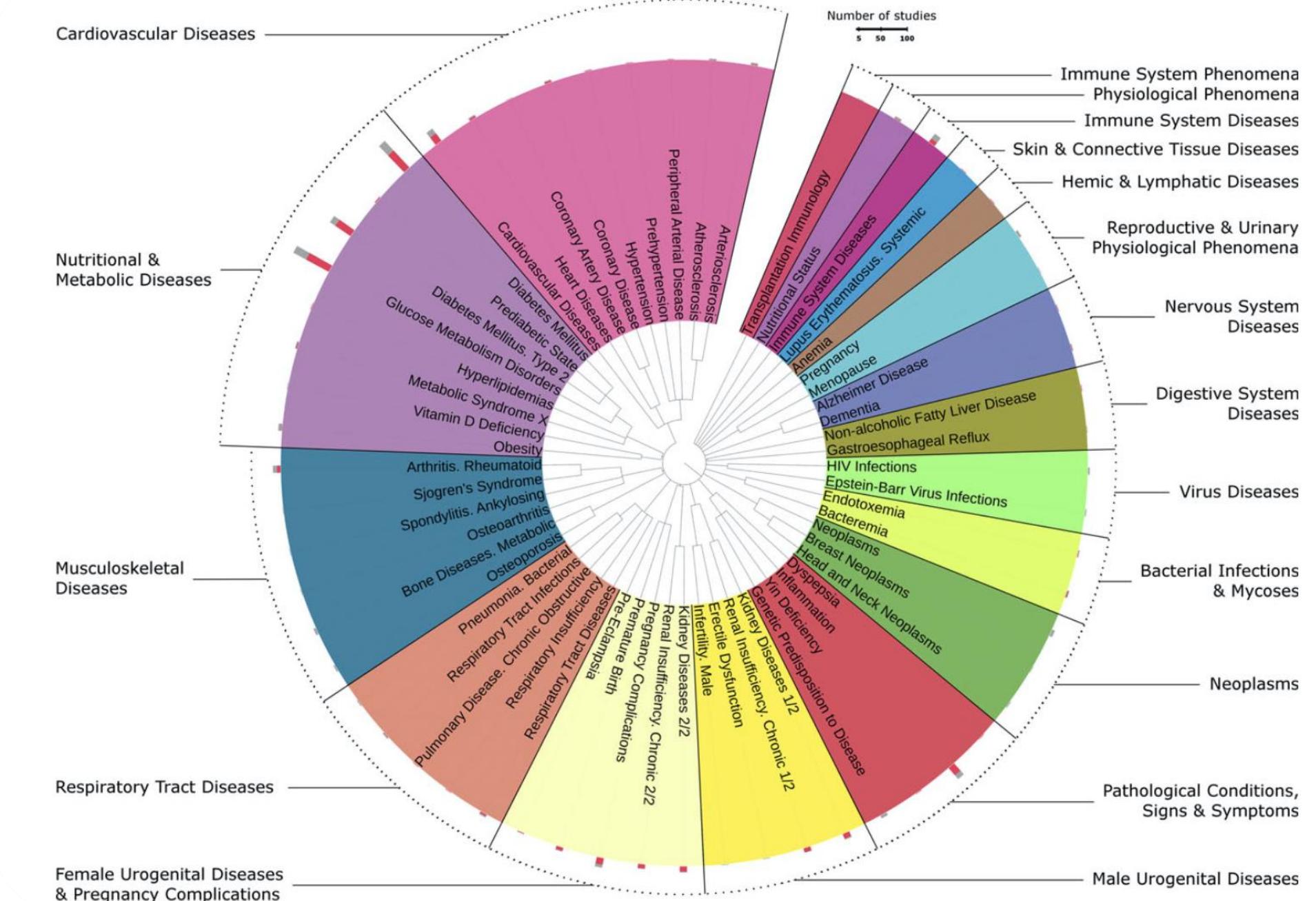
COVID-19 et la maladie parodontale?



- La moitié des patients atteints de formes sévères d'infection à la COVID-19 présentaient également une parodontite sévère
- Un quart d'entre eux y étaient hautement susceptibles
- Le patients susceptible à la parodontite ont un risque plus élevés d' avoir des formes de COVID-19 sévères et être hospitalisés aux soins intensifs



Associations systémiques





Merci de votre attention!!!