

# Is Salivary NGF a Biomarker for painful TMD?

Mai Abdel-Azim<sup>1</sup>, Gornitsky M.<sup>1</sup>, Fricton J.<sup>2</sup>, Sander P.<sup>1</sup>, Velly A.M.<sup>1</sup>

Faculty of Dentistry, McGill University<sup>1</sup>, Montreal, Quebec, Canada and School of Dentistry, University of Minnesota<sup>2</sup>, Minneapolis, Minnesota, USA

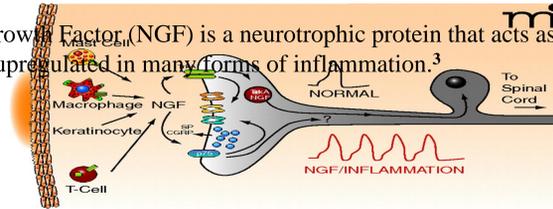
## Introduction

**Temporomandibular disorder (TMD)** is a common musculoskeletal disorder affecting the masticatory muscles and/or the temporomandibular joint.<sup>1</sup>

**Rationale:** Identifying painful-TMD biomarkers, that could be used for pain assessment, diagnosis and prognosis of the disease.

**What is a Biomarker?** “a characteristic that is objectively measured and evaluated as an indicator of normal biological processes, pathogenic processes, or pharmacologic responses to a therapeutic intervention.”<sup>2</sup>

**Candidate biomarker:** Nerve Growth Factor (NGF) is a neurotrophic protein that acts as a peripheral pain mediator and is upregulated in many forms of inflammation.<sup>3</sup>



## Aim

To assess if salivary NGF (sNGF) is a biomarker of painful TMD, pain intensity or specific painful-TMD complaints.

## Methods

Painful-TMD cases and 90 healthy-controls were selected from National Institute of Dental and Craniofacial Research's TMJ Implant Registry and Repository (NIDCR's TIRR).

Painful-TMD diagnosis was determined by clinical examination conducted by calibrated clinicians using a Modified Craniomandibular Index.<sup>4</sup>

Unstimulated whole saliva was collected.

NGF levels measured using commercially available ELISA kits.

Anova, t-test, chi-square, and multivariable linear regression analysis were used. Alpha level = 5%.

## Results

### Study sample.

- 86 painful-TMD cases (43 yrs, 93% females)
- 90 healthy-controls (34 yrs, 67% females)

**Table 1. Log sNGF means are not significantly different between painful-TMD cases and controls.**

	Mean (95% Confidence interval)	P-value
	TMD cases (n = 86)	Controls (n = 90)
NGF	2.77 (2.63-2.90)	2.86 (2.72-2.98) 0.27

•Figure 1. NGF level (log NGF) was not associated with current pain intensity (0-10 NRS, mp9)

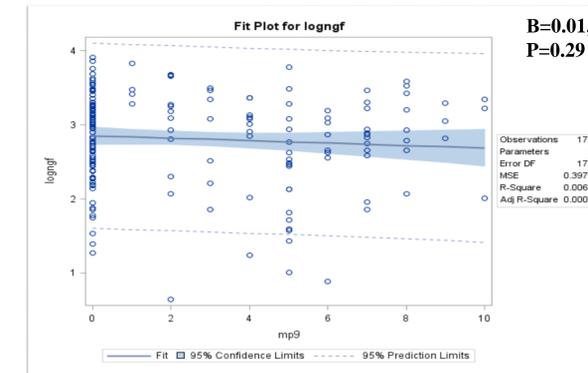
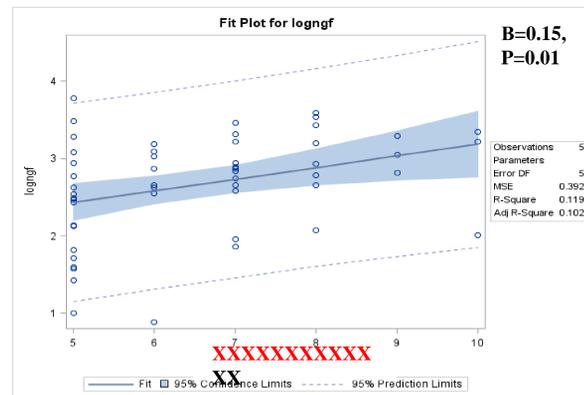


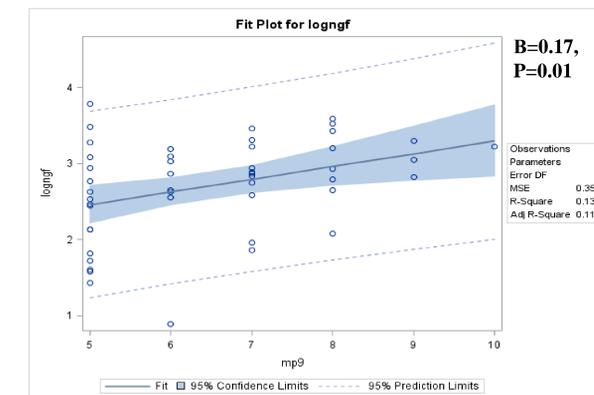
Figure 3. Association between logNGF and moderate to severe current pain and (>5, 0-10 NRS, mp9)



**Table 2. log sNGF is positively associated with: age, gender (males) and stress (n = 176).**

Factors	Slope	SE	P-value
Age	0.05	0.002	<0.001
Gender	0.91	0.20	<0.001
Stress	0.65	0.17	0.0002
TO DO			

Figure 4. Association between logNGF and moderate to severe current pain and (>5, 0-10 NRS) among xxx females.



**Table 2. log sNGF is positively associated with: age, gender (males) and stress (n = 176).**

Factors	Slope	SE	P-value
Age	0.05	0.002	<0.001
Gender	0.91	0.20	<0.001
Stress	0.65	0.17	0.0002

## Results

**Table 3. log sNGF is positively associated with: age, moderate to severe pain (>5, 0-10 NRS) and facial pain (n = 53).**

Factors	Slope	SE	P-value
Age	0.02	0.006	0.003
Current pain (5-10)	0.35	0.04	<0.001
Facial pain	0.52	0.24	0.04
To DO			

**Table 4. Log sNGF is not related to the duration of painful-TMD.**

	Mean (95% Confidence interval)	P
	TMD < 1 yr (n = 22)	TMD ≥ 1 yr (n = 64)
NGF	2.89 (2.43-3.10)	2.41 (2.72-2.98) 0.36

## Conclusions

- **Potential biomarker for pain severity** - since increase in the level of slogNGF was associated with moderate to severe current pain intensity.
- **No evidence as biomarker for TMD occurrence** – since no significant difference was found on slogNGF between cases and controls.
- These evidences were noted independent of participants age, gender.

## References

1-LeResche L, Mancl LA, Drangsholt MT, Huang G, Von Korff M (2007). Predictors of onset of facial pain and temporomandibular disorders in early adolescence. Pain 129(3):269-278.  
 2-Strimbu, Kyle; Jorge, Tavel (2010). “What are Biomarkers?” Current Opinion in HIV and AIDS. 5 (6): 463–466.  
 3-Pezet S, McMahon SB (2006). Neurotrophins: mediators and modulators of pain. Annu Rev Neurosci 29(507-538).  
 4-Fricton J. and Schiffman E. (1987) The craniomandibular index: validity. J Prosthet Dent. 58(2): 222-228

## Contact

Mai Abdel-Azim , [mai.abdel-azim@mail.mcgill.ca](mailto:mai.abdel-azim@mail.mcgill.ca),  
 Ana Velly DDS, MS, PhD, [ana.velly@mcgill.ca](mailto:ana.velly@mcgill.ca)

## Acknowledgement

**NIDCR**  
 National Institute of  
 Dental and Craniofacial  
 Research

