



This is a repository copy of *Correlation between matrix metalloproteinase presence and caries surface appearance*.

White Rose Research Online URL for this paper:

<https://eprints.whiterose.ac.uk/215919/>

Version: Supplemental Material

Article:

El Sharkasi, L., Bingle, L. orcid.org/0000-0002-4587-9384, Martin, N. orcid.org/0000-0002-6380-559X et al. (1 more author) (2024) Correlation between matrix metalloproteinase presence and caries surface appearance. *Caries Research*, 58 (6). pp. 562-572. ISSN 0008-6568

<https://doi.org/10.1159/000539580>

© 2024 The Authors. Except as otherwise noted, this author-accepted version of a journal article published in *Caries Research* is made available via the University of Sheffield Research Publications and Copyright Policy under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>

Reuse

This article is distributed under the terms of the Creative Commons Attribution (CC BY) licence. This licence allows you to distribute, remix, tweak, and build upon the work, even commercially, as long as you credit the authors for the original work. More information and the full terms of the licence here:

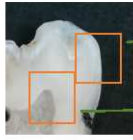
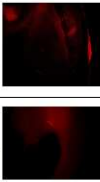

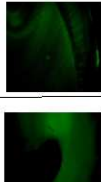

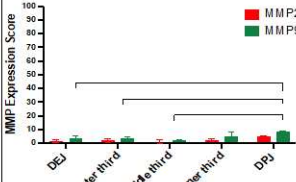





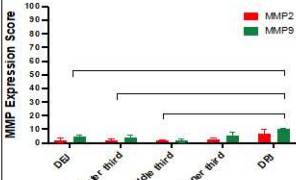
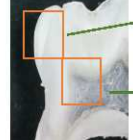

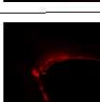


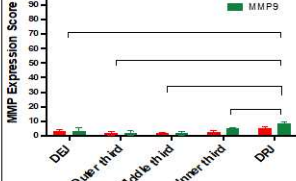





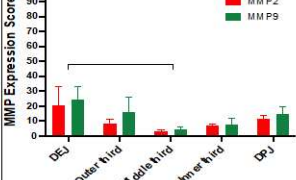

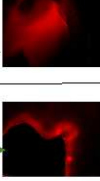
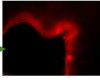
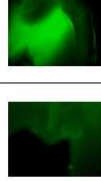
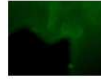
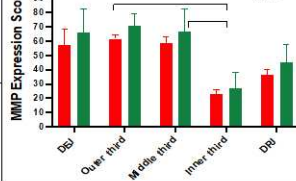





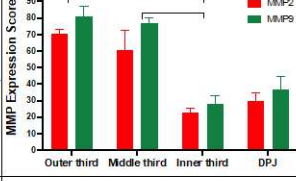
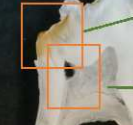



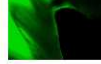
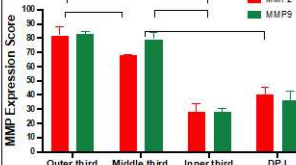
<https://creativecommons.org/licenses/>

Takedown

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.



eprints@whiterose.ac.uk
<https://eprints.whiterose.ac.uk/>

Photographic images of tooth sections with caries recorded with the ICDAS score	Gelatinolytic MMP expressions		Expression of MMPs across the depth of the caries																		
	MMP2	MMP9																			
ICDAS 0: Sound tooth surface. 	 	 	 <table border="1"> <caption>MMP Expression Score for ICDAS 0</caption> <thead> <tr> <th>Depth</th> <th>MMP2</th> <th>MMP9</th> </tr> </thead> <tbody> <tr> <td>DEJ</td> <td>~5</td> <td>~5</td> </tr> <tr> <td>Outer third</td> <td>~5</td> <td>~5</td> </tr> <tr> <td>Middle third</td> <td>~5</td> <td>~5</td> </tr> <tr> <td>Inner third</td> <td>~5</td> <td>~5</td> </tr> <tr> <td>DPJ</td> <td>~5</td> <td>~5</td> </tr> </tbody> </table>	Depth	MMP2	MMP9	DEJ	~5	~5	Outer third	~5	~5	Middle third	~5	~5	Inner third	~5	~5	DPJ	~5	~5
Depth	MMP2	MMP9																			
DEJ	~5	~5																			
Outer third	~5	~5																			
Middle third	~5	~5																			
Inner third	~5	~5																			
DPJ	~5	~5																			
ICDAS 1: First visual change in enamel with air drying. 	 	 	 <table border="1"> <caption>MMP Expression Score for ICDAS 1</caption> <thead> <tr> <th>Depth</th> <th>MMP2</th> <th>MMP9</th> </tr> </thead> <tbody> <tr> <td>DEJ</td> <td>~5</td> <td>~5</td> </tr> <tr> <td>Outer third</td> <td>~5</td> <td>~5</td> </tr> <tr> <td>Middle third</td> <td>~5</td> <td>~5</td> </tr> <tr> <td>Inner third</td> <td>~5</td> <td>~5</td> </tr> <tr> <td>DPJ</td> <td>~5</td> <td>~5</td> </tr> </tbody> </table>	Depth	MMP2	MMP9	DEJ	~5	~5	Outer third	~5	~5	Middle third	~5	~5	Inner third	~5	~5	DPJ	~5	~5
Depth	MMP2	MMP9																			
DEJ	~5	~5																			
Outer third	~5	~5																			
Middle third	~5	~5																			
Inner third	~5	~5																			
DPJ	~5	~5																			
ICDAS 2: Distinct visual change in enamel without air drying. 	 	 	 <table border="1"> <caption>MMP Expression Score for ICDAS 2</caption> <thead> <tr> <th>Depth</th> <th>MMP2</th> <th>MMP9</th> </tr> </thead> <tbody> <tr> <td>DEJ</td> <td>~5</td> <td>~5</td> </tr> <tr> <td>Outer third</td> <td>~5</td> <td>~5</td> </tr> <tr> <td>Middle third</td> <td>~5</td> <td>~5</td> </tr> <tr> <td>Inner third</td> <td>~5</td> <td>~5</td> </tr> <tr> <td>DPJ</td> <td>~5</td> <td>~5</td> </tr> </tbody> </table>	Depth	MMP2	MMP9	DEJ	~5	~5	Outer third	~5	~5	Middle third	~5	~5	Inner third	~5	~5	DPJ	~5	~5
Depth	MMP2	MMP9																			
DEJ	~5	~5																			
Outer third	~5	~5																			
Middle third	~5	~5																			
Inner third	~5	~5																			
DPJ	~5	~5																			
ICDAS 3: Localised enamel breakdown with no visible dentine. 	 	 	 <table border="1"> <caption>MMP Expression Score for ICDAS 3</caption> <thead> <tr> <th>Depth</th> <th>MMP2</th> <th>MMP9</th> </tr> </thead> <tbody> <tr> <td>DEJ</td> <td>~20</td> <td>~25</td> </tr> <tr> <td>Outer third</td> <td>~10</td> <td>~15</td> </tr> <tr> <td>Middle third</td> <td>~5</td> <td>~10</td> </tr> <tr> <td>Inner third</td> <td>~10</td> <td>~15</td> </tr> <tr> <td>DPJ</td> <td>~15</td> <td>~20</td> </tr> </tbody> </table>	Depth	MMP2	MMP9	DEJ	~20	~25	Outer third	~10	~15	Middle third	~5	~10	Inner third	~10	~15	DPJ	~15	~20
Depth	MMP2	MMP9																			
DEJ	~20	~25																			
Outer third	~10	~15																			
Middle third	~5	~10																			
Inner third	~10	~15																			
DPJ	~15	~20																			
ICDAS 4: Underlying dark shadow from dentine. 	 	 	 <table border="1"> <caption>MMP Expression Score for ICDAS 4</caption> <thead> <tr> <th>Depth</th> <th>MMP2</th> <th>MMP9</th> </tr> </thead> <tbody> <tr> <td>DEJ</td> <td>~60</td> <td>~70</td> </tr> <tr> <td>Outer third</td> <td>~65</td> <td>~75</td> </tr> <tr> <td>Middle third</td> <td>~60</td> <td>~70</td> </tr> <tr> <td>Inner third</td> <td>~30</td> <td>~40</td> </tr> <tr> <td>DPJ</td> <td>~40</td> <td>~50</td> </tr> </tbody> </table>	Depth	MMP2	MMP9	DEJ	~60	~70	Outer third	~65	~75	Middle third	~60	~70	Inner third	~30	~40	DPJ	~40	~50
Depth	MMP2	MMP9																			
DEJ	~60	~70																			
Outer third	~65	~75																			
Middle third	~60	~70																			
Inner third	~30	~40																			
DPJ	~40	~50																			
ICDAS 5: Cavity with visible dentine. 	 	 	 <table border="1"> <caption>MMP Expression Score for ICDAS 5</caption> <thead> <tr> <th>Depth</th> <th>MMP2</th> <th>MMP9</th> </tr> </thead> <tbody> <tr> <td>Outer third</td> <td>~75</td> <td>~85</td> </tr> <tr> <td>Middle third</td> <td>~65</td> <td>~80</td> </tr> <tr> <td>Inner third</td> <td>~25</td> <td>~35</td> </tr> <tr> <td>DPJ</td> <td>~35</td> <td>~45</td> </tr> </tbody> </table>	Depth	MMP2	MMP9	Outer third	~75	~85	Middle third	~65	~80	Inner third	~25	~35	DPJ	~35	~45			
Depth	MMP2	MMP9																			
Outer third	~75	~85																			
Middle third	~65	~80																			
Inner third	~25	~35																			
DPJ	~35	~45																			
ICDAS 6: Extensive cavity with visible dentine. 	 	 	 <table border="1"> <caption>MMP Expression Score for ICDAS 6</caption> <thead> <tr> <th>Depth</th> <th>MMP2</th> <th>MMP9</th> </tr> </thead> <tbody> <tr> <td>Outer third</td> <td>~85</td> <td>~90</td> </tr> <tr> <td>Middle third</td> <td>~70</td> <td>~85</td> </tr> <tr> <td>Inner third</td> <td>~30</td> <td>~40</td> </tr> <tr> <td>DPJ</td> <td>~40</td> <td>~50</td> </tr> </tbody> </table>	Depth	MMP2	MMP9	Outer third	~85	~90	Middle third	~70	~85	Inner third	~30	~40	DPJ	~40	~50			
Depth	MMP2	MMP9																			
Outer third	~85	~90																			
Middle third	~70	~85																			
Inner third	~30	~40																			
DPJ	~40	~50																			