



< Back to results | 1 of 1

↗ Export ↗ Download Print E-mail PDF Save to PDF ☆ Add to List More... >

Full Text | View at Publisher|

Document type

Article

Source type

Journal

ISSN

08927014

DOI

10.1080/08927014.2021.1967334

Publisher

Taylor and Francis Ltd.

CODEN

BFOUE

Original language

English

View less ^

Biofouling • Volume 37, Issue 7, Pages 767 - 776 • 2021

Streptococcus salivarius K12 inhibits Candida albicans aggregation, biofilm formation and dimorphism

Mokhtar M.^{a, b}, Rismayuddin N.A.R.^b, Mat Yassim A.S.^{b, c}, Ahmad H.^{a, b}, Abdul Wahab R.^a, Dashper S.^d, Arzmi M.H.^{b, c}

Save all to author list

^a Department of Biomedical Sciences, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, Kuantan, Pahang, Malaysia

^b Cluster of Cancer Research Initiative IIUM (COCRII), International Islamic University Malaysia, Kuantan, Pahang, Malaysia

^c Department of Fundamental Dental and Medical Sciences, Kulliyyah of Dentistry, International Islamic University Malaysia, Kuantan, Pahang, Malaysia

^d Melbourne Dental School, The University of Melbourne, Melbourne, VIC, Australia

Cited by 0 documents

Inform me when this document is cited in Scopus:

Set citation alert >

Related documents

An in vitro model for oral mixed biofilms of *Candida albicans* and *Streptococcus gordonii* in synthetic saliva

Montelongo-Jauregui, D. , Srinivasan, A. , Ramasubramanian, A.K. (2016) *Frontiers in Microbiology*

Candida–streptococcal interactions in biofilm-associated oral diseases

Koo, H. , Andes, D.R. , Krysan, D.J. (2018) *PLoS Pathogens*

Interkingdom interaction between *C. albicans* and *S. salivarius* on titanium surfaces

Martorano-Fernandes, L. , Rodrigues, N.C. , de Souza Borges, M.H. (2020) *BMC Oral Health*

View all related documents based on references

Find more related documents in Scopus based on:

Authors > Keywords >

Abstract

Author keywords

Indexed keywords

SciVal Topics

Funding details

Abstract

Candida albicans causes candidiasis, particularly in immunocompromised patients. *Streptococcus salivarius* K12 (K12) is a probiotic isolated from a healthy oral cavity. The study aimed to determine the effect of K12 on *C. albicans* aggregation , biofilm formation and dimorphism . *C. albicans*

ATCC MYA-4901, acquired immunodeficiency syndrome (AIDS) isolate (ALC2), and oral cancer isolate (ALC3) and K12 were used in the study. All *C. albicans* strains and K12 were grown in yeast peptone dextrose agar and brain heart infusion agar, respectively, prior to aggregation, biofilm and dimorphism assays. Auto-aggregation of *C. albicans* MYA-4901 and ALC2 was categorised as high, while the co-aggregation of the strains was low in the presence of K12. *C. albicans* total cell count decreased significantly when co-cultured with K12 compared with monocultured *C. albicans* biofilm ($p < 0.05$). Inhibition of yeast-to-hyphae transition was also observed when co-cultured with K12. In conclusion, K12 inhibits *C. albicans* aggregation, biofilm formation and dimorphism. © 2021 Informa UK Limited, trading as Taylor & Francis Group.

Author keywords

aggregation ; biofilm ; dimorphism ; Polymicrobial interactions; probiotic

Indexed keywords

SciVal Topics

Funding details

References (64)

[View in search results format >](#)

☐ All

[Export](#)  [Print](#)  [E-mail](#)  [Save to PDF](#) [Create bibliography](#)

- ☐ 1 Allaker, R.P., Stephen, A.S.
Use of Probiotics and Oral Health ([Open Access](#))
 (2017) *Current Oral Health Reports*, 4 (4), pp. 309-318. Cited 37 times.
[springer.com/journal/40496](https://www.springer.com/journal/40496)
 doi: 10.1007/s40496-017-0159-6
[View at Publisher](#)
- ☐ 2 Alnuaimi, A.D., O'Brien-Simpson, N.M., Reynolds, E.C., Mccullough, M.J.
Clinical isolates and laboratory reference Candida species and strains have varying abilities to form biofilms ([Open Access](#))
 (2013) *FEMS Yeast Research*, 13 (7), pp. 689-699. Cited 45 times.
 doi: 10.1111/1567-1364.12068
[View at Publisher](#)
- ☐ 3 Ardizzoni, A., Pericolini, E., Paulone, S., Orsi, C.F., Castagnoli, A., Oliva, I., Strozzi, E., (...), Blasi, E.
In vitro effects of commercial mouthwashes on several virulence traits of Candida albicans, viridans streptococci and Enterococcus faecalis colonizing the oral cavity ([Open Access](#))
 (2018) *PLoS ONE*, 13 (11), art. no. e0207262. Cited 15 times.
<https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0207262&type=printable>
 doi: 10.1371/journal.pone.0207262
[View at Publisher](#)
- ☐ 4 Arzmi, M.H., Dashper, S., Catmull, D., Cirillo, N., Reynolds, E.S., McCullough, M.
Coaggregation of Candida albicans, Actinomyces naeslundii and Streptococcus mutans is Candida albicans strain dependent ([Open Access](#))
 (2015) *FEMS Yeast Research*, 15 (5). Cited 26 times.
<http://femsyr.oxfordjournals.org/>
 doi: 10.1093/femsyr/fov038
[View at Publisher](#)

-
- ☐ 5 Arzmi, M.H., Alnuaimi, A.D., Dashper, S., Cirillo, N., Reynolds, E.C., McCullough, M.
Polymicrobial biofilm formation by *Candida albicans*, *Actinomyces naeslundii*, and *Streptococcus mutans* is *Candida albicans* strain and medium dependent ([Open Access](#))
- (2016) *Medical Mycology*, 54 (8), pp. 856-864. Cited 16 times.
<https://mmy.oxfordjournals.org/>
doi: 10.1093/mmy/myw042
- [View at Publisher](#)
-
- ☐ 6 Bar-Yosef, H., Vivanco Gonzalez, N., Ben-Aroya, S., Kron, S.J., Kornitzer, D.
Chemical inhibitors of *Candida albicans* hyphal morphogenesis target endocytosis ([Open Access](#))
- (2017) *Scientific Reports*, 7 (1), art. no. 5692. Cited 25 times.
www.nature.com/srep/index.html
doi: 10.1038/s41598-017-05741-y
- [View at Publisher](#)
-
- ☐ 7 Burton, J.P., Wescombe, P.A., Moore, C.J., Chilcott, C.N., Tagg, J.R.
Safety assessment of the oral cavity probiotic *Streptococcus salivarius* K12 ([Open Access](#))
- (2006) *Applied and Environmental Microbiology*, 72 (4), pp. 3050-3053. Cited 101 times.
doi: 10.1128/AEM.72.4.3050-3053.2006
- [View at Publisher](#)
-
- ☐ 8 Burton, J.P., Cowley, S., Simon, R.R., McKinney, J., Wescombe, P.A., Tagg, J.R.
Evaluation of safety and human tolerance of the oral probiotic *Streptococcus salivarius* K12: A randomized, placebo-controlled, double-blind study
- (2011) *Food and Chemical Toxicology*, 49 (9), pp. 2356-2364. Cited 50 times.
doi: 10.1016/j.fct.2011.06.038
- [View at Publisher](#)
-
- ☐ 9 Calderone, R.A., Fonzi, W.A.
Virulence factors of *Candida albicans*
- (2001) *Trends in Microbiology*, 9 (7), pp. 327-335. Cited 920 times.
doi: 10.1016/S0966-842X(01)02094-7
- [View at Publisher](#)
-
- ☐ 10 Cavalcanti, Y.W., Morse, D.J., da Silva, W.J., Del-Bel-Cury, A.A., Wei, X., Wilson, M., Milward, P., (...), Williams, D.W.
Virulence and pathogenicity of *Candida albicans* is enhanced in biofilms containing oral bacteria
- (2015) *Biofouling*, 31 (1), pp. 27-38. Cited 57 times.
www.tandf.co.uk/journals/titles/08927014.asp
doi: 10.1080/08927014.2014.996143
- [View at Publisher](#)
-

- 11 Chukkapalli, S.S., Velsko, I.M., Rivera-Kweh, M.F., Zheng, D., Lucas, A.R., Kesavalu, L.
Polymicrobial oral infection with four periodontal bacteria orchestrates a distinct inflammatory response and atherosclerosis in ApoE^{null} mice ([Open Access](#))
(2015) *PLoS ONE*, 10 (11), art. no. e0143291. Cited 48 times.
<http://www.plosone.org/article/fetchObject.action?uri=info:doi/10.1371/journal.pone.0143291&representation=PDF>
doi: 10.1371/journal.pone.0143291

[View at Publisher](#)

- 12 Delorme, C., Abraham, A.-L., Renault, P., Guédon, E.
Genomics of *Streptococcus salivarius*, a major human commensal
(2015) *Infection, Genetics and Evolution*, 33, pp. 381-392. Cited 32 times.
<http://www.elsevier.com/locate/meegid>
doi: 10.1016/j.meegid.2014.10.001

[View at Publisher](#)

- 13 Denega, I., D'Enfert, C., Bachellier-Bassi, S.
Candida albicans biofilms are generally devoid of persister cells ([Open Access](#))
(2019) *Antimicrobial Agents and Chemotherapy*, 63 (5), art. no. e01979-18. Cited 7 times.
<https://aac.asm.org/content/aac/63/5/e01979-18.full.pdf>
doi: 10.1128/AAC.01979-18

[View at Publisher](#)

- 14 Dewhirst, F.E., Chen, T., Izard, J., Paster, B.J., Tanner, A.C.R., Yu, W.-H., Lakshmanan, A., (...), Wade, W.G.
The human oral microbiome ([Open Access](#))
(2010) *Journal of Bacteriology*, 192 (19), pp. 5002-5017. Cited 1649 times.
<http://j.b.asm.org/cgi/reprint/192/19/5002>
doi: 10.1128/JB.00542-10

[View at Publisher](#)

- 15 Dimopoulos, G., Paiva, J.-A., Meersseman, W., Pahl, J., Grigoras, I., Sganga, G., Montravers, P., (...), Ruhnke, M.
Efficacy and safety of anidulafungin in elderly, critically ill patients with invasive *Candida* infections: A post hoc analysis ([Open Access](#))
(2012) *International Journal of Antimicrobial Agents*, 40 (6), pp. 521-526. Cited 13 times.
doi: 10.1016/j.ijantimicag.2012.07.018

[View at Publisher](#)

- 16 Falsetta, M.L., Klein, M.I., Colonne, P.M., Scott-Anne, K., Gregoire, S., Pai, C.-H., Gonzalez-Begne, M., (...), Koo, H.
Symbiotic relationship between *Streptococcus mutans* and *Candida albicans* synergizes virulence of plaque biofilms in vivo ([Open Access](#))
(2014) *Infection and Immunity*, 82 (5), pp. 1968-1981. Cited 260 times.
<http://iai.asm.org/content/82/5/1968.full.pdf>
doi: 10.1128/IAI.00087-14

[View at Publisher](#)

- 17 Ghannoum, M.A., Jurevic, R.J., Mukherjee, P.K., Cui, F., Sikaroodi, M., Naqvi, A., Gillevet, P.M.

Characterization of the oral fungal microbiome (mycobiome) in healthy individuals (Open Access)

(2010) *PLoS Pathogens*, 6 (1), art. no. e1000713. Cited 578 times.
<http://www.plospathogens.org/article/fetchObjectAttachment.action?uri=info%3Adoi%2F10.1371%2Fjournal.ppat.1000713&representation=PDF>
doi: 10.1371/journal.ppat.1000713

[View at Publisher](#)

- 18 Gholizadeh, P., Eslami, H., Yousefi, M., Asgharzadeh, M., Aghazadeh, M., Kafil, H.S.

Role of oral microbiome on oral cancers, a review

(2016) *Biomedicine and Pharmacotherapy*, 84, pp. 552-558. Cited 91 times.
www.elsevier.com/locate/biomedpharm
doi: 10.1016/j.biopha.2016.09.082

[View at Publisher](#)

- 19 Hull, M.W., Chow, A.W.

Indigenous Microflora and Innate Immunity of the Head and Neck

(2007) *Infectious Disease Clinics of North America*, 21 (2), pp. 265-282. Cited 37 times.
doi: 10.1016/j.idc.2007.03.015

[View at Publisher](#)

- 20 Hyink, O., Wescombe, P.A., Upton, M., Ragland, N., Burton, J.P., Tagg, J.R.

Salivaricin A2 and the novel lantibiotic salivaricin B are encoded at adjacent loci on a 190-kilobase transmissible megaplasmid in the oral probiotic strain *Streptococcus salivarius* K12 (Open Access)

(2007) *Applied and Environmental Microbiology*, 73 (4), pp. 1107-1113. Cited 103 times.
doi: 10.1128/AEM.02265-06

[View at Publisher](#)

- 21 Ishijima, S.A., Hayama, K., Burton, J.P., Reid, G., Okada, M., Matsushita, Y., Abe, S.

Effect of *Streptococcus salivarius* K12 on the In vitro growth of *Candida albicans* and its protective effect in an oral candidiasis model (Open Access)

(2012) *Applied and Environmental Microbiology*, 78 (7), pp. 2190-2199. Cited 68 times.
<http://aem.asm.org/content/78/7/2190.full.pdf>
doi: 10.1128/AEM.07055-11

[View at Publisher](#)

- 22 Ishikawa, K.H., Mayer, M.P.A., Miyazima, T.Y., Matsubara, V.H., Silva, E.G., Paula, C.R., Campos, T.T., (...), Nakamae, A.E.M.

A multispecies probiotic reduces oral candida colonization in denture wearers

(2015) *Journal of Prosthodontics*, 24 (3), pp. 194-199. Cited 56 times.
doi: 10.1111/jopr.12198

[View at Publisher](#)

- ☐ 23 Jabra-Rizk, M.A., Kong, E.F., Tsui, C., Nguyen, M.H., Clancy, C.J., Fidel, P.L., Noverr, M.
Candida albicans pathogenesis: Fitting within the host-microbe damage response framework (Open Access)
(2016) *Infection and Immunity*, 84 (10), pp. 2724-2739. Cited 87 times.
<http://iai.asm.org/content/84/10/2724.full.pdf>
doi: 10.1128/IAI.00469-16
[View at Publisher](#)
-
- ☐ 24 Jakubovics, N.S.
Intermicrobial Interactions as a Driver for Community Composition and Stratification of Oral Biofilms
(2015) *Journal of Molecular Biology*, 427 (23), pp. 3662-3675. Cited 48 times.
<https://www.journals.elsevier.com/journal-of-molecular-biology>
doi: 10.1016/j.jmb.2015.09.022
[View at Publisher](#)
-
- ☐ 25 James, K.M., MacDonald, K.W., Chanyi, R.M., Cadieux, P.A., Burton, J.P.
Inhibition of Candida albicans biofilm formation and modulation of gene expression by probiotic cells and supernatant (Open Access)
(2016) *Journal of Medical Microbiology*, 65 (4), pp. 328-336. Cited 36 times.
http://www.microbiologyresearch.org/docserver/fulltext/jmm/65/4/320_jmm00231.pdf?expires
doi: 10.1099/jmm.0.000226
[View at Publisher](#)
-
- ☐ 26 Jarosz, L.M., Deng, D.M., Van Der Mei, H.C., Crielaard, W., Krom, B.P.
Streptococcus mutans competence-stimulating peptide inhibits candida albicans hypha formation (Open Access)
(2009) *Eukaryotic Cell*, 8 (11), pp. 1658-1664. Cited 121 times.
<http://ec.asm.org/cgi/reprint/8/11/1658>
doi: 10.1128/EC.00070-09
[View at Publisher](#)
-
- ☐ 27 Kaci, G., Goudercourt, D., Dennin, V., Pot, B., Doré, J., Ehrlich, S.D., Renault, P., (...), Delorme, C.
Anti-inflammatory properties of Streptococcus salivarius, a commensal bacterium of the oral cavity and digestive tract (Open Access)
(2014) *Applied and Environmental Microbiology*, 80 (3), pp. 928-934. Cited 59 times.
<http://aem.asm.org/content/80/3/928.full.pdf>
doi: 10.1128/AEM.03133-13
[View at Publisher](#)
-
- ☐ 28 Kauffman, C.A.
Fungal infections in older adults (Open Access)
(2001) *Clinical Infectious Diseases*, 33 (4), pp. 550-555. Cited 94 times.
doi: 10.1086/322685
[View at Publisher](#)
-

- 29 Klotz, S.A., Gaur, N.K., De Armond, R., Sheppard, D., Khardori, N., Edwards, J.E., Lipke, P.N., (...), El-Azizi, M.

Candida albicans Als proteins mediate aggregation with bacteria and yeasts ([Open Access](#))

(2007) *Medical Mycology*, 45 (4), pp. 363-370. Cited 82 times.
doi: 10.1080/13693780701299333

[View at Publisher](#)

- 30 Koh, A.Y., Köhler, J.R., Coggshall, K.T., Van Rooijen, N., Pier, G.B.

Mucosal damage and neutropenia are required for Candida albicans dissemination ([Open Access](#))

(2008) *PLoS Pathogens*, 4 (2). Cited 228 times.
<http://www.plospathogens.org/article/fetchObjectAttachment.action?uri=info%3Adoi%2F10.1371%2Fjournal.ppat.0040035&representation=PDF>
doi: 10.1371/journal.ppat.0040035

[View at Publisher](#)

- 31 Kong, E.F., Kucharíková, S., Van Dijck, P., Peters, B.M., Shirtliff, M.E., Jabra-Rizka, M.A.

Clinical implications of oral candidiasis: Host tissue damage and disseminated bacterial disease ([Open Access](#))

(2015) *Infection and Immunity*, 83 (2), pp. 604-613. Cited 58 times.
<http://iai.asm.org/content/83/2/604.full.pdf>
doi: 10.1128/IAI.02843-14

[View at Publisher](#)

- 32 Krom, B.P., Kidwai, S., Ten Cate, J.M.

Candida and other fungal species: Forgotten players of healthy oral microbiota

(2014) *Journal of Dental Research*, 93 (5), pp. 445-451. Cited 72 times.
<http://jdr.sagepub.com/>
doi: 10.1177/0022034514521814

[View at Publisher](#)

- 33 LaFleur, M.D., Kumamoto, C.A., Lewis, K.

Candida albicans biofilms produce antifungal-tolerant persister cells ([Open Access](#))

(2006) *Antimicrobial Agents and Chemotherapy*, 50 (11), pp. 3839-3846. Cited 336 times.
doi: 10.1128/AAC.00684-06

[View at Publisher](#)

- 34 Lohse, M.B., Gulati, M., Johnson, A.D., Nobile, C.J.

Development and regulation of single-and multi-species Candida albicans biofilms ([Open Access](#))

(2018) *Nature Reviews Microbiology*, 16 (1), pp. 19-31. Cited 187 times.
<http://www.nature.com/nrmicro/index.html>
doi: 10.1038/nrmicro.2017.107

[View at Publisher](#)

- 35 Lone, M.S., Bashir, G., Bali, N., Sajad, S., Aejaaz, S., Bashir, H., Ahmad, J.
Oral Candida colonization and infection in cancer patients and their antifungal susceptibility in a tertiary care hospital
(2014) *Int J Adv Res*, 2, pp. 541-550. Cited 11 times.

-
- ☐ 36 Low, C.-Y., Rotstein, C.
Emerging fungal infections in immunocompromised patients
([Open Access](#))

(2011) *F1000 Medicine Reports*, 3 (1), art. no. 14. Cited 169 times.
<http://f1000.com/reports/m/3/14/pdf>
doi: 10.3410/M3-14

[View at Publisher](#)
-
- ☐ 37 McCall, A.D., Pathirana, R.U., Prabhakar, A., Cullen, P.J., Edgerton, M.
Candida albicans biofilm development is governed by cooperative attachment and adhesion maintenance proteins
([Open Access](#))

(2019) *npj Biofilms and Microbiomes*, 5 (1), art. no. 21. Cited 30 times.
<https://www.nature.com/npjbiofilms/>
doi: 10.1038/s41522-019-0094-5

[View at Publisher](#)
-
- ☐ 38 Montelongo-Jauregui, D., Lopez-Ribot, J.L.
Candida interactions with the oral bacterial microbiota
([Open Access](#))

(2018) *Journal of Fungi*, 4 (4), art. no. 122. Cited 16 times.
www.mdpi.com/journal/jof
doi: 10.3390/jof4040122

[View at Publisher](#)
-
- ☐ 39 Morales, D.K., Hogan, D.A.
Candida albicans interactions with bacteria in the context of human health and disease ([Open Access](#))

(2010) *PLoS Pathogens*, 6 (4), pp. 1-4. Cited 177 times.
<http://www.plospathogens.org/article/fetchObjectAttachment.action?uri=info%3Adoi%2F10.1371%2Fjournal.ppat.1000886&representation=PDF>
doi: 10.1371/journal.ppat.1000886

[View at Publisher](#)
-
- ☐ 40 Nobbs, A.H., Jenkinson, H.F.
Interkingdom networking within the oral microbiome
([Open Access](#))

(2015) *Microbes and Infection*, 17 (7), pp. 484-492. Cited 26 times.
<http://www.journals.elsevier.com/microbes-and-infection/>
doi: 10.1016/j.micinf.2015.03.008

[View at Publisher](#)
-
- ☐ 41 Nobile, C.J., Johnson, A.D.
Candida albicans Biofilms and Human Disease ([Open Access](#))

(2015) *Annual Review of Microbiology*, 69 (1), pp. 71-92. Cited 441 times.
<http://arjournals.annualreviews.org/loi/micro>
doi: 10.1146/annurev-micro-091014-104330

[View at Publisher](#)
-

- 42 Pearce, C., Bowden, G.H., Evans, M., Fitzsimmons, S.P., Johnson, J., Sheridan, M.J., Wientzen, R., (...), Cole, M.F.
Identification of pioneer viridans streptococci in the oral cavity of human neonates ([Open Access](#))

(1995) *Journal of Medical Microbiology*, 42 (1), pp. 67-72. Cited 96 times.
<http://jmm.sgmjournals.org/>
doi: 10.1099/00222615-42-1-67

[View at Publisher](#)

- 43 Di Pierro, F., Colombo, M., Zanvit, A., Risso, P., Rottoli, A.S.
Use of Streptococcus salivarius K12 in the prevention of streptococcal and viral pharyngotonsillitis in children ([Open Access](#))

(2014) *Drug, Healthcare and Patient Safety*, 6 (1), pp. 15-20. Cited 38 times.
<http://www.dovepress.com/getfile.php?fileID=18986>
doi: 10.2147/dhps.s59665

[View at Publisher](#)

- 44 Prakash, B., Shekar, M., Maiti, B., Karunasagar, I., Padiyath, S.
Prevalence of candida spp. Among healthy denture and nondenture wearers with respect to hygiene and age ([Open Access](#))

(2015) *Journal of Indian Prosthodontist Society*, 15 (1), pp. 29-32. Cited 16 times.
<http://www.springer.com/medicine/dentistry/journal/13191>
doi: 10.4103/0972-4052.155041

[View at Publisher](#)

- 45 Rodrigues, M.E., Gomes, F., Rodrigues, C.F.
Candida spp./bacteria mixed biofilms ([Open Access](#))

(2020) *Journal of Fungi*, 6 (1), art. no. 5. Cited 32 times.
<https://www.mdpi.com/2309-608X/6/1/5/pdf>
doi: 10.3390/jof6010005

[View at Publisher](#)

- 46 Sato, T., Kishi, M., Suda, M., Sakata, K., Shimoda, H., Miura, H., Ogawa, A., (...), Kobayashi, S.
Prevalence of Candida albicans and non-albicans on the tongue dorsa of elderly people living in a post-disaster area: A cross-sectional survey ([Open Access](#))

(2017) *BMC Oral Health*, 17 (1), art. no. 51. Cited 11 times.
<http://www.biomedcentral.com/bmcoralhealth/>
doi: 10.1186/s12903-017-0342-0

[View at Publisher](#)

- 47 Silverman, R.J., Nobbs, A.H., Vickerman, M.M., Barbour, M.E., Jenkinson, H.F.
Interaction of Candida albicans cell wall Als3 Protein with Streptococcus gordonii SspB adhesin promotes development of mixed-species communities ([Open Access](#))

(2010) *Infection and Immunity*, 78 (11), pp. 4644-4652. Cited 150 times.
<http://iai.asm.org/cgi/reprint/78/11/4644>
doi: 10.1128/IAI.00685-10

[View at Publisher](#)

-
- ☐ 48 Smith, D.J., Anderson, J.M., King, W.F., van Houte, J., Taubman, M.A.
Oral streptococcal colonization of infants

(1993) *Oral Microbiology and Immunology*, 8 (1), pp. 1-4. Cited 78 times.
doi: 10.1111/j.1399-302X.1993.tb00535.x

[View at Publisher](#)
-
- ☐ 49 Southey-Pillig, C.J., Davies, D.G., Sauer, K.
Characterization of temporal protein production in *Pseudomonas aeruginosa* biofilms ([Open Access](#))

(2005) *Journal of Bacteriology*, 187 (23), pp. 8114-8126. Cited 151 times.
doi: 10.1128/JB.187.23.8114-8126.2005

[View at Publisher](#)
-
- ☐ 50 Staniszewska, M.
Virulence factors in candida species

(2020) *Current Protein and Peptide Science*, 21 (3), pp. 313-323. Cited 14 times.
<http://www.eurekaselect.com/173711/article>
doi: 10.2174/1389203720666190722152415

[View at Publisher](#)
-
- ☐ 51 Su, C., Yu, J., Lu, Y.
Hyphal development in *Candida albicans* from different cell states

(2018) *Current Genetics*, 64 (6), pp. 1239-1243. Cited 17 times.
link.springer.de/link/service/journals/00294/index.htm
doi: 10.1007/s00294-018-0845-5

[View at Publisher](#)
-
- ☐ 52 Taylan, I., Özcan, I., Mumcuoğlu, I., Baran, I., Özcan, K.M., Akdoğan, O., Selcuk, A., (...), Dere, H.
Comparison of the Surface and Core Bacteria in Tonsillar and Adenoid Tissue With Beta-Lactamase Production ([Open Access](#))

(2011) *Indian Journal of Otolaryngology and Head and Neck Surgery*, 63 (3), pp. 223-228. Cited 19 times.
doi: 10.1007/s12070-011-0265-z

[View at Publisher](#)
-
- ☐ 53 Urban, C.F., Reichard, U., Brinkmann, V., Zychlinsky, A.
Neutrophil extracellular traps capture and kill *Candida albicans* and hyphal forms ([Open Access](#))

(2006) *Cellular Microbiology*, 8 (4), pp. 668-676. Cited 623 times.
doi: 10.1111/j.1462-5822.2005.00659.x

[View at Publisher](#)
-
- ☐ 54 Vila, T., Sultan, A.S., Montelongo-Jauregui, D., Jabra-Rizk, M.A.
Oral candidiasis: A disease of opportunity ([Open Access](#))

(2020) *Journal of Fungi*, 6 (1), art. no. 15. Cited 46 times.
<https://www.mdpi.com/2309-608X/6/1/15/pdf>
doi: 10.3390/jof6010015

[View at Publisher](#)
-

- 55 Vílchez, R., Lemme, A., Ballhausen, B., Thiel, V., Schulz, S., Jansen, R., Sztajer, H., (...), Wagner-Döbler, I.

Streptococcus mutans inhibits Candida albicans hyphal formation by the fatty acid signaling molecule trans-2-decenoic acid (SDSF)

(2010) *ChemBioChem*, 11 (11), pp. 1552-1562. Cited 84 times.
<http://www3.interscience.wiley.com/cgi-bin/fulltext/123549118/PDFSTART>
doi: 10.1002/cbic.201000086

[View at Publisher](#)

- 56 Wall, G., Montelongo-Jauregui, D., Vidal Bonifacio, B., Lopez-Ribot, J.L., Uppuluri, P.

Candida albicans biofilm growth and dispersal: contributions to pathogenesis (Open Access)

(2019) *Current Opinion in Microbiology*, 52, pp. 1-6. Cited 44 times.
<http://www.elsevier.com/locate/mib>
doi: 10.1016/j.mib.2019.04.001

[View at Publisher](#)

- 57 Weerasekera, M.M., Wijesinghe, G.K., Jayarathna, T.A., Gunasekara, C.P., Fernando, N., Kottegoda, N., Samaranayake, L.P.

Culture media profoundly affect Candida Albicans and Candida tropicalis growth, adhesion and biofilm development (Open Access)

(2016) *Memorias do Instituto Oswaldo Cruz*, 111 (11), pp. 697-702. Cited 41 times.
http://memorias.ioc.fiocruz.br/issues/current-issue/item/download/7625_d7c5f33b074139bb760d1d52ca063943
doi: 10.1590/0074-02760160294

[View at Publisher](#)

- 58 Williams, D., Lewis, M.

Pathogenesis and treatment of oral candidosis (Open Access)

(2011) *Journal of Oral Microbiology*, 3 (2011), art. no. 5771. Cited 185 times.
<http://www.journaloforalmicrobiology.net/index.php/jom/article/download/5771/6961>
doi: 10.3402/jom.v3i0.5771

[View at Publisher](#)

- 59 Xu, H., Jenkinson, H.F., Dongari-Bagtzoglou, A.

Innocent until proven guilty: Mechanisms and roles of Streptococcus-Candida interactions in oral health and disease (Open Access)

(2014) *Molecular Oral Microbiology*, 29 (3), pp. 99-116. Cited 71 times.
<http://www.interscience.wiley.com/jpages/2041-1006>
doi: 10.1111/omi.12049

[View at Publisher](#)

- 60 Yang, Y.-L.

Virulence factors of Candida species

(2003) *Journal of Microbiology, Immunology and Infection*, 36 (4), pp. 223-228. Cited 172 times.

□ 61 Yoo, H.-J., Jwa, S.-K., Kim, D.-H., Ji, Y.-J.
Inhibitory effect of *Streptococcus salivarius* K12 and M18 on halitosis in vitro (Open Access)
(2020) *Clinical and Experimental Dental Research*, 6 (2), pp. 207-214. Cited 3 times.
www.cedrjournal.com
doi: 10.1002/cre2.269
View at Publisher

□ 62 Zago, C.E., Silva, S., Sanitá, P.V., Barbugli, P.A., Dias, C.M.I., Lordello, V.B., Vergani, C.E.
Dynamics of biofilm formation and the Interaction between *Candida albicans* and methicillin-susceptible (MSSA) and -resistant *Staphylococcus aureus* (MRSA) (Open Access)
(2015) *PLoS ONE*, 10 (4), art. no. e0123206. Cited 77 times.
<http://www.plosone.org/article/fetchObject.action?uri=info:doi/10.1371/journal.pone.0123206&representation=PDF>
doi: 10.1371/journal.pone.0123206
View at Publisher

□ 63 Zijnge, V., Van Leeuwen, M.B.M., Degener, J.E., Abbas, F., Thurnheer, T., Gmür, R., Harmsen, H.J.M.
Oral biofilm architecture on natural teeth (Open Access)
(2010) *PLoS ONE*, 5 (2), art. no. e9321. Cited 371 times.
<http://www.plosone.org/article/fetchObjectAttachment.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0009321&representation=PDF>
doi: 10.1371/journal.pone.0009321
View at Publisher

□ 64 Zupancic, K., Kriksic, V., Kovacevic, I., Kovacevic, D.
Influence of Oral Probiotic *Streptococcus salivarius* K12 on Ear and Oral Cavity Health in Humans: Systematic Review
(2017) *Probiotics and Antimicrobial Proteins*, 9 (2), pp. 102-110. Cited 24 times.
<http://www.springer.com/new+%26+forthcoming+titles+%28default%29/journal/12602>
doi: 10.1007/s12602-017-9261-2
View at Publisher

👤 Arzmi, M.H.; Cluster of Cancer Research Initiative IIUM (COCRII), International Islamic University Malaysia, Kuantan, Pahang, Malaysia
© Copyright 2021 Elsevier B.V., All rights reserved.

About Scopus

What is Scopus
Content coverage
Scopus blog
Scopus API
Privacy matters

Language

日本語に切り替える
切换到简体中文
切换到繁體中文
Русский язык

Customer Service

Help
Contact us

We use cookies to help provide and enhance our service and tailor content. By continuing, you agree to the use of cookies.