

Fungitell[®]

(1→3)- β -D-Glucan Detection Assay

Fungitell[®] & FungitellSTAT[®] Reference List

Selected references for
clinical, pre-clinical and basic
research involving diagnostic
(1→3)- β -D-Glucanemia

Fungitell[®]

MKT#25-285

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Categories:

- A. Fungitell® Diagnostic Performance**
- B. β-D-Glucan Kinetics**
- C. Fungitell® Meta-Analyses**
- D. Additional Matrices** (Research Use Only)
- E. Beta-Glucan Comparison Studies**
- F. Review Articles**
- G. Clinical Guidelines**
- H. Fungitell STAT®**
- I. Miscellaneous**

A. Fungitell® Diagnostic Performance

1. Mikulska M, Ullah N, Magnasco L, *et al.* Lower (1,3)-Beta-D-Glucan sensitivity and in vitro levels in *Candida auris* and *Candida parapsilosis* strains. *Clin Microbiol Infect.* 2024;30(6): 822-7.
2. Novy E, Rivi re J, Nguyen M, *et al.* Combination of serum and peritoneal 1,3-Beta-D-Glucan can rule out intra-abdominal candidiasis in surgical critically ill patients: a multicenter prospective study. *Crit Care.* 2023;27(1):470.
3. Kritikos A, Caruana G, Poissy J, *et al.* Comparison of Three β-Glucan Tests for the Diagnosis of Invasive Candidiasis in Intensive Care Units. *J Clin Microbiol.* 2023;61(2):e0169122.
4. Mikulska M, Furfaro E, Magnasco L, *et al.* Levels of Beta-D-Glucan in *Candida auris* supernatants, an in vitro and in vivo preliminary study. *Clin Microbiol Infect.* 2022;28(8):1154.e1-1154.e3.
5. Ferreras-Antolin L, Aziz N, Warris A. Serial (1→3)-β-D-Glucan (BDG) monitoring shows high variability among premature neonates. *Med Mycol.* 2022;60(6):myac032.
6. Garnham K, Halliday CL, Rai NJ, *et al.* Introducing 1,3-β-D-Glucan for screening and diagnosis of invasive fungal diseases in Australian high-risk haematology patients: is there a clinical benefit. *Intern Med J.* 2022;52(3):426-35.
7. Lee N, Kym D. Clinical Usefulness of Serum (1→3)-β-D-glucan to predict invasive candidiasis in patients with severe burn trauma. *J Microbiol Immunol Infect.* 2022;55(1):138-46.
8. Juniper T, Eades CP, Gil E, *et al.* Use of β-D-glucan in diagnosis of suspected *Pneumocystis jirovecii* pneumonia in adults with HIV infection. *Int J STD AIDS.* 2021;32(11):1074-7.
9. White PL, Price JS, Backx M. Evaluation of the Performance of the Associates of Cape Cod STAT Assay for the Diagnosis of Invasive Fungal Disease in Critical-Care Patients with COVID-19. *J Clin Microbiol.* 2021;59(9):e0086921.
10. Esteves P, Lopes Lima S, Salles de Azevedo Melo A, Maria Beir o E, Nucci M, Colombo AL. (1,3)-β-D-glucan is able to predict therapeutic failure of patients with candidemia and not only mortality. *Mycoses.* 2021;64(3):264-71.
11. Lamoth F, Akan H, Andes D, *et al.* Assessment of the Role of 1,3-β-D-Glucan Testing for the Diagnosis of Invasive Fungal Infections in Adults. *Clin Infect Dis.* 2021;72(Suppl 2):S102-S108. doi:10.1093/cid/cia1943
12. Mikulska M, Balletto E, Castagnola E, Mularoni A. Beta-D-Glucan in Patients with Haematological Malignancies. *J Fungi (Basel).* 2021;7(12): 1046. Published 2021 Dec 7. doi:10.3390/jof7121046
13. D'Ordine RL, Garc a KA, Roy J, Zhang Y, Markley B, Finkelman MA. Performance characteristics of Fungitell STAT®, a rapid (1→3)-β-D-glucan single patient sample in vitro diagnostic assay. *Med Mycol.* 2021;59(1):41-9.
14. Kritikos A, Poissy J, Croxatto A, Bochud PY, Pagani JL, Lamoth F. Impact of the Beta-Glucan Test on Management of Intensive Care Unit Patients at Risk for Invasive Candidiasis. *J Clin Microbiol.* 2020;58(6): e01996-19. Published 2020 May 26. doi:10.1128/JCM.01996-19
15. White SK, Schmidt RL, Walker BS, Hanson KE. (1→3)-β-D-glucan testing for the detection of invasive fungal infections in immunocompromised or critically ill people. *Cochrane Database Syst Rev.* 2020;7(7):CD009833.
16. Rogina P, Skvarc M. Diagnostic accuracy of (1,3)-β-D-glucan to predict *Pneumocystis jirovecii* pneumonia in non-HIV-infected patients. *Radiol Oncol.* 2020;54(2):221-6.
17. Agnelli C, Bouza E, Del Carmen Mart nez-Jim nez M, *et al.* Clinical Relevance and Prognostic Value of Persistently Negative (1,3)-β-D-Glucan in Adults With Candidemia: A 5-year Experience in a Tertiary Hospital. *Clin Infect Dis.* 2020;70(9):1925-32.
18. Cohen JF, Ouziel A, Matczak S, *et al.* Diagnostic accuracy of serum (1,3)-Beta-D-Glucan for neonatal invasive candidiasis: systematic review and meta-analysis. *Clin Microbiol Infect.* 2020;26(3):291-8.
19. Melo ASA, Santos DWCL, Lima SL, *et al.* Evaluation of (1→3)-β-D-glucan assay for diagnosing paracoccidioidomycosis. *Mycoses.* 2020;63(1):38-42.
20. Guo J, Wu Y, Lai W, Lu W, Mu X. The diagnostic value of (1→3)-β-D-glucan alone or combined with traditional inflammatory markers in neonatal invasive candidiasis. *BMC Infect Dis.* 2019 Aug 14;19(1):716. doi: 10.1186/s12879-019-4364-x. PubMed [citation] PMID: 31412796, PMCID: PMC6692940
21. Desoubreux G, Chesnay A, Mercier V, Bras-Cachinho J, Moshiri P, Eymieux S, De Kyvon MA, Lemaignan A, Goudeau A, Bailly  . Combination of β-(1,3)-D-glucan testing in serum and qPCR in nasopharyngeal aspirate for facilitated diagnosis of *Pneumocystis jirovecii* pneumonia. *Mycoses.* 2019 Sep 8. doi: 10.1111/myc.12997. [Epub ahead of print] PubMed [citation] PMID: 31494981
22. Corsi-Vasquez G, Ostrosky-Zeichner L, Pilkington EF 3rd, Sax PE. Point-Counterpoint: Should serum β-D-glucan testing be used for the diagnosis of *Pneumocystis jirovecii* pneumonia? *J Clin Microbiol.* 2019 Aug 21. pii: JCM.01340-19. doi: 10.1128/JCM.01340-19. [Epub ahead of print] PubMed [citation] PMID: 31434728
23. Engsb ro AL, Najat S, J rgensen KM, Kurtzhals JAL, Arendrup MC. Diagnostic accuracy of the 1,3-β-D-glucan test for *pneumocystis* pneumonia in a tertiary university hospital in Denmark: A retrospective study. *Med Mycol.* 2019;57(6):710-7.
24. Nucci M, Barreiros G, Reis H, Paix o M, Akiti T, Nou r SA. Performance of 1,3-beta-D-glucan in the diagnosis and monitoring of invasive fusariosis. *Mycoses.* 2019;62(7):570-5.
25. Rautemaa V, Green HD, Jones AM, and Rautemaa-Richardson R. (2017). High level of β-(1,3)-D-glucan antigenaemia in cystic fibrosis in the absence of invasive fungal disease. *Diagn. Microbiol. Infect. Dis.* 88:316-321.
26. Rouz  A, Loridant S, Poissy J, Dervaux B, Sendid B, Cornu M, and Nseir S.; S-TAFE study group. (2017). Biomarker-based strategy for early discontinuation of empirical antifungal treatment in critically ill patients: a randomized controlled trial. *Intensive Care Med.* 2017 Sep 22. doi:10.1007/s00134-017-4932-8.
27. Pang YK, Ip M, You JH, (2017). Potential clinical and economic outcomes of active β-D-glucan surveillance with preemptive therapy for invasive candidiasis at intensive care units: a decision model analysis. *Eur. J. Clin. Microbiol. Infect. Dis.* 36:187-194.
28. Giacobbe DR, Mikulska M, Tumbarello M, Furfaro E, Spadaro M, Losito AR, Mesini A, De Pascale G, Marchese A, Bruzzone M, Pelosi P, Mussap M, Molin A, Antonelli M, Posteraro B, Sanguinetti M, Viscoli C, and Del Bono V; ISGRI-SITA (Italian Study Group on Resistant Infections of the Societ  Italiana Terapia Antinfettiva). (2017). Combined use of serum (1→3)-β-D-glucan and procalcitonin for the early differential diagnosis between candidaemia and bacteraemia in intensive care units. *Crit. Care.* 21:176.

29. Lahmer T, da Costa CP, Held J, *et al.* Usefulness of 1,3 Beta-D-Glucan Detection in non-HIV Immunocompromised Mechanical Ventilated Critically Ill Patients with ARDS and Suspected *Pneumocystis jirovecii* Pneumonia. *Mycopathologia*. 2017;182(7-8):701-8.
30. Levesque E, Rizk F, Noorah Z, *et al.* Detection of (1,3)-β-D-Glucan for the Diagnosis of Invasive Fungal Infection in Liver Transplant Recipients. *Int J Mol Sci*. 2017;18(4):862.
31. Slim J, Saling C, Szabela M, Brown M, Johnson T, Goldfarb I. (1→3)-β-D-Glucan Assay in Monitoring Response to Anti-Fungal Therapy in Fungal Endocarditis. *J Heart Valve Dis*. 2017;26(2): 208-10.
32. Posteraro B, Tumbarello M, De Pascale G, Liberto E, Vallecoccia MS, De Carolis E, Di Gravio V, Trecarichi EM, Sanguinetti M, and Antonelli, M, (2016). (1→3)-β-D-Glucan-based antifungal treatment in critically ill adults at high risk of candidaemia: an observational study. *J Antimicrob Chemother*. 71:2262-9.
33. Prattes J, Raggam RB, Vanstraelen K, Rabensteiner J, Hoegenauer C, Krause R, Prüller F, Wölfler A, Spriet I, and Hoenigl M, (2016). Chemotherapy-Induced Intestinal Mucosal Barrier Damage: a Cause of Falsely Elevated Serum (1→3)-β-D-Glucan Levels? *J. Clin. Microbiol*. 54:798-801.
34. Nucci M, Nouér SA, Esteves P, Guimarães T, Breda G, de Miranda BG, Queiroz-Telles F, and Colombo AL, (2016) Discontinuation of empirical antifungal therapy in ICU patients using 1,3-β-D-glucan. *J Antimicrob Chemother*. 71:2628-33.
35. Lahmer T, Neuenhahn M, Held J, Rasch S, Schmid RM, Huber W. Comparison of 1,3-β-D-Glucan with galactomannan in serum and bronchoalveolar fluid for the detection of *Aspergillus* species in immunosuppressed mechanical ventilated critically ill patients. *J Crit Care*. 2016;36:259-64.
36. Lahmer T, Rasch S, Schnappauf C, Beitz A, Schmid RM, Huber W. Comparison of Serum Galactomannan and 1,3-β-D-Glucan Determination for Early Detection of Invasive Pulmonary Aspergillosis in Critically Ill Patients with Hematological Malignancies and Septic Shock. *Mycopathologia*. 2016;181(7-8):505-11.
37. Mikulska M, Giacobbè DR, Furfaro E, *et al.* Lower sensitivity of serum (1,3)-β-D-Glucan for the diagnosis of candidaemia due to *Candida parapsilosis*. *Clin Microbiol Infect*. 2016;22(7): 646.e5-8.
38. Reischies FM, Prattes J, Woelfler A, Eigl S, Hoenigl M. Diagnostic performance of 1,3-Beta-D-Glucan serum screening in patients receiving hematopoietic stem cell transplantation. *Transpl Infect Dis*. 2016;18(3):466-70.
39. Pini P, Bettua C, Orsi CF, *et al.* Evaluation of serum (1→3)-β-D-glucan clinical performance: kinetic assessment, comparison with galactomannan and evaluation of confounding factors. *Infection*. 2016; 44(2):223-33.
40. Raggam RB, Fischbach LM, Prattes J, Duettmann W, Eigl S, Reischies F, Wölfler A, Rabensteiner J, Pruellner F, Krause R, and Hoenigl M, 92015). Detection of (1→3)-β-D-glucan in same-day urine and serum samples obtained from patients with haematological malignancies. *Mycoses*. 58:394-8.
41. Hammarström H, Kondori N, Friman V, and Wennerås C, (2015). How to interpret serum levels of beta-glucan for the diagnosis of invasive fungal infections in adult high-risk hematology patients: optimal cut-off levels and confounding factors. *Eur J. Clin. Microbiol Infect Dis*. 34:917-25.
42. Mutschlechner W, Risslegger B, Willinger B, *et al.* Bronchoalveolar Lavage Fluid (1,3)-β-D-Glucan for the Diagnosis of Invasive Fungal Infections in Solid Organ Transplantation: A Prospective Multicenter Study. *Transplantation*. 2015;99(9):e140-4.
43. He S, Hang JP, Zhang L, Wang F, Zhang DC, Gong FH. A systematic review and meta-analysis of diagnostic accuracy of serum 1,3-β-D-glucan for invasive fungal infection: Focus on cutoff levels. *J Microbiol Immunol Infect*. 2015;48(4):351-61.
44. Levesque E, El Anbassi S, Sitterle E, Foulet F, Merle JC, Botterel F. Contribution of (1,3)-Beta-D-Glucan to diagnosis of invasive candidiasis after liver transplantation. *J Clin Microbiol*. 2015;53(3):771-6.
45. Damiani C, Le Gal S, Goin N, *et al.* Usefulness of (1,3)-β-D-glucan detection in bronchoalveolar lavage samples in *Pneumocystis* pneumonia and *Pneumocystis* pulmonary colonization. *J Mycol Med*. 2015;25(1):36-43.
46. Ceasay MM, Desai SR, Berry L, Cleverley J, Kibbler CC, Pomplun S, Nicholson AG, Douiri A, Wade J, Smith M, Mufti GJ, and Pagliuca A, (2015). A comprehensive diagnostic approach using galactomannan, targeted β-D-glucan, baseline computerized tomography and biopsy yields a significant burden of invasive fungal disease in at risk haematology patients. *Br. J. Haematol*. 168:219-29.
47. Prattes J, Hoenigl M, Rabensteiner J, Raggam RB, Pruellner F, Zollner-Schwetz I, Valentin T, Hoenigl K, Fruhwald S, and Krause R, (2014). Serum (1→3)-β-D-glucan for antifungal treatment stratification at the intensive care unit and the influence of surgery. *Mycoses*. 57:679-86.
48. Ostrosky-Zeichner L, *et al.* (2014) MSG-01: A randomized, double-blind, placebo-controlled trial of caspofungin prophylaxis followed by pre-emptive therapy for invasive candidiasis in high risk adults in the critical care setting. *Clin. Infect. Dis*. 58:1219-26.
49. Esteves F, *et al.* (2014). (1→3)-β-D-glucan in association with lactate dehydrogenase as biomarkers of *Pneumocystis* pneumonia (PCP) in HIV infected patients. *Eur. J. Clin. Microbiol. Infect. Dis*. 33:1173–1180.
50. Prüller F, Wagner J, Raggam RB, *et al.* Automation of serum (1→3)-β-D-Glucan testing allows reliable and rapid discrimination of patients with and without candidemia. *Med Mycol*. 2014;52(5):455-61.
51. Clancy CJ, Nguyen MH. Undiagnosed invasive candidiasis: incorporating non-culture diagnostics into rational prophylactic and preemptive antifungal strategies. *Expert Rev Anti Infect Ther*. 2014;12(7):731-4.
52. Fernandez-Silva F, *et al.* (2014). Experimental murine acromoniosis: an emerging opportunistic human infection. *Med. Mycol*. 52: 29-35.
53. Sulahian A, Porcher R, Bergeron A, *et al.* Use and limits of (1→3)-β-DGlucan assay (Fungitell®), compared to galactomannan determination (Platelia Aspergillus), for diagnosis of invasive aspergillosis. *J Clin Microbiol*. 2014;52(7):2328-33.
54. Poissy J, Sendid B, Damiens S, *et al.* Presence of *Candida* cell wall derived polysaccharides in the sera of intensive care unit patients: relation with candidaemia and *Candida* colonisation. *Crit Care*. 2014;18(3):R135.
55. Wood BR, *et al.* (2013). Test performance of blood beta-glucan for *Pneumocystis jirovecii* pneumonia in patients with AIDS and respiratory symptoms. *AIDS* 27: 967-972.
56. Racil Z, Kocmanova I, Toskova M, Winterova J, Lengerova M, Timilsina S, Mayer J, (2013). Reactivity of the (1→3)-β-D-glucan assay during bacteraemia: limited evidence from a prospective study. *Mycoses*. 56:101-4.
57. Metan G, Koç AN, Kaynar LG, Atalay A, Öztürk A, Eser B, Cetin M, (2013). What is the role of the (1→3)-β-D-glucan assay in the screening of patients undergoing autologous haematopoietic stem-cell transplantation? *Mycoses*. 56:34-8.
58. Lobo ML, Esteves F, de Sousa B, Cardoso F, Cushion MT, Antunes F, Matos O, (2013). Therapeutic potential of caspofungin combined with trimethoprim sulfamethoxazole for *Pneumocystis pneumonia*: a pilot study in mice. *PLoS One*.8(8):e70619. doi: 10.1371/journal.pone. 0070619.
59. Hoarau G, *et al.* (2013). Detection of (1→3)-β-D-glucans in situ in a *Candida albicans* brain granuloma. *J. Infect*. 67: 622-4.
60. Goudjil S, *et al.* (2013). (1→3)-β-D-glucan levels in candidiasis infections in the critically ill neonate. *J. Maternal-Fetal & Neonatal Med*. 26:44-8.
61. Edathodou J, *et al.* (2013) Invasive fungal infection due to *Triadelpia pulvinata* in a patient with acute myeloid leukemia. *J. Clin. Microbiol*. 51:3426-9.

62. Tissot F, Lamoth F, Hauser PM, *et al.* β-glucan antigenemia anticipates diagnosis of blood culture-negative intraabdominal candidiasis. *Am J Respir Crit Care Med.* 2013;188(9):1100-9.
63. De Pascale, G., Posteraro, B., Cutuli, S.L., Caricato, A., Lepore, D., Tumbarello, M., Pennisi, M.A., Sanguinetti, M., and Antonelli, M. (2013). Why should we monitor (1g3)-b-D-glucan levels during invasive candidiasis? Just ask your ophthalmologist! *J. Clin. Microbiol.* 51:1645-6
64. Damiani C, Le Gal S, Da Costa C, Virmaux M, Nevez G, Totet A. Combined quantification of pulmonary *Pneumocystis jirovecii* DNA and serum (1→3)-β-D-glucan for differential diagnosis of *pneumocystis* pneumonia and *Pneumocystis* colonization. *J Clin Microbiol.* 2013; 51(10):3380-8.
65. Held J, Kohlberger I, Rappold E, Busse Grawitz A, Häcker G. Comparison of (1→3)-β-D-glucan, mannan/anti-mannan antibodies, and Cand-Tec *Candida* antigen as serum biomarkers for candidemia. *J Clin Microbiol.* 2013;51(4):1158-64.
66. Theel ES, Jespersen DJ, Iqbal S, *et al.* Detection of (1,3)-β-D-glucan in bronchoalveolar lavage and serum samples collected from immunocompromised hosts. *Mycopathologia.* 2013;175(1-2):33-41.
67. Metan G, Koç AN, Agkus C, Kaynar LG, Alp E, Eser B. (2012). Can bacteraemia lead to false positive results in (1→3)-β-D-glucan test? Analysis of 83 bacteraemia episodes in high-risk patients for invasive fungal infections. *Rev. Iberoam Micol.* 29:169-71.
68. Lengerova M, Kocmanova I, Racil Z, Hrnčirova K, Pospisilova S, Mayer J, Najvar LK, Wiederhold NP, Kirkpatrick WR, Patterson TF, (2012). Detection and measurement of fungal burden in a guinea pig model of invasive pulmonary aspergillosis by novel quantitative nested real-time PCR compared with galactomannan and (1→3)-β-D-glucan detection. *J. Clin. Microbiol.* 50:602-8.
69. Hanson KE, *et al.* (2012). β-D-glucan surveillance with preemptive anidulafungin for invasive candidiasis in intensive care unit patients: A randomized pilot study. *PLoS One* 7: e42282.
70. Ginocchio F, *et al.* (2012). Case report of the reliability of (1→3)-β-D-glucan monitoring during the treatment of peritoneal candidiasis in a child receiving continuous peritoneal dialysis. *Clin. Vacc. Immunol.* 19: 626-7.
71. Metan G, Koç AN, Atalay A, *et al.* What should be the optimal cut-off of serum 1,3-β-D-glucan for the detection of invasive pulmonary aspergillosis in patients with haematological malignancies. *Scand J Infect Dis.* 2012;44(5):330-6.
72. Del Bono V, Delfino E, Furfaro E, Mikulska M, Nicco E, Bruzzi P, Mularoni A, Bassetti M, Viscoli C, (2011). Clinical Performance of the (1→3)-β-D-Glucan Assay in Early Diagnosis of Nosocomial *Candida* Bloodstream Infections. (2011). *Clin. Vaccine Immunol.* 18:2113-7.
73. Yoshida K, *et al.* (2011). Clinical viability of Fungitell®, a new (1→3)-β-D-glucan measurement kit, for diagnosis of invasive fungal infection, and comparison with other kits available in Japan. *J. Infect. Chemother.* 17:473-477.
74. Sax PE, Komarow L, Finkelman M, Grant PM, Andersen J, Scully E, Powderly WG, and Zolopa AR, for the AIDS Clinical Trials Group Study A5164 Team., (2011). Blood (1→3)-β-D-Glucan as a diagnostic test for HIV-related *Pneumocystis jirovecii* pneumonia. *Clin. Inf. Dis.* 53:197-202.
75. Posteraro, B., De Pascale, G., Tumbarello, M., Torelli, R., Pennisi, M.A., Bello G, Maviglia R, Fadda G, Sanguinetti M, Antonelli M, (2011). Early diagnosis of Candidemia in intensive care unit patients with sepsis: a prospective comparison of (1→3)-β-D-glucan assay, *Candida* score, and colonization index. *Crit. Care.* 22;15:R249.
76. Metan G, Agkus C, Koç AN, Elmali F, Finkelman MA, (2011). Does ampicillin-sulbactam cause false positivity of (1→3)-β-D-glucan assay? A prospective evaluation of 15 patients without invasive fungal infections *Mycoses.* 55: 366-71.
77. Mokaddas E, Khan ZU, Ahmad S, Nampoory MR, Burmah M, (2011). Value of (1→3)-β-D-glucan, *Candida* mannan and *Candida* DNA detection in the diagnosis of candidaemia. *Clin. Microbiol. Infect.* 17:1549-53.
78. Montagna MT, Coretti C, Lovero G, De Giglio O, Montagna O, Laforgia N, Santoro N, Caggiano G, (2011). Diagnostic Performance of (1→3)-β-D-Glucan in Neonatal and Pediatric Patients with Candidemia. *Int. J. Mol. Sci.* 12:5871-7.
79. Mackay CA, Ballot DE, Perovic O, (2011). Serum (1→3)-β-D-Glucan assay in the diagnosis of invasive fungal disease in neonates. *Pediatr Rep.* 16;3:e14.
80. Heyland D, Jiang X, Day AG, and Laverdiere M, (2011). Serum β-D-glucan of critically ill patients with suspected ventilator-associated pneumonia: Preliminary observations. *J. Crit. Care.* 5: 536.e1-536.e9.
81. Held J, Koch M, Reischl U, Danner T, Serr A, (2011). Serum (1→3)-β-D-Glucan measurement as early indicator for *Pneumocystis jirovecii* pneumonia and evaluation of its prognostic value. *Clin. Microbiol. Infect.* 17: 595-602.
82. Gonzales BE, Faverio LA, Marty FM, MacArthur C, and Churchill RB, (2011). Elevated serum beta-D-glucan levels in immunocompromised children with clinical suspicion for *Pneumocystis jirovecii* pneumonia. *Clin. Vacc. Immunol.* 18: 1202–1203.
83. Eggimann P, Marchetti O, (2011). Is (1→3)-β-D-glucan the missing link from bedside assessment to pre-emptive therapy of invasive candidiasis? *Crit. Care.* 15:1017.
84. Chowdhary A, Randhawa HS, Singh V, Khan ZU, Ahmad S, Kathuria S, Roy P, Khanna G, Chandra J, (2011). *Bipolaris hawaiiensis* as etiologic agent of allergic bronchopulmonary mycosis: first case in a paediatric patient. *Med. Mycol.* 49:760-5. C101.
85. Bellanger, AP, Grenouillet, F, Henon, T, Skana, F, Legrand, F, Deconinck, E, Millon, L, (2011). Retrospective assessment of β-D-(1,3)-glucan for presumptive diagnosis of fungal infections. *APMIS.* 119:280-6.
86. De Vlieger G, Lagrou K, Maertens J, Verbeken E, Meersseman W, Van Wijngaerden E. Beta-D-Glucan detection as a diagnostic test for invasive aspergillosis in immunocompromised critically ill patients with symptoms of respiratory infection: an autopsy-based study. *J Clin Microbiol.* 2011;49(11):3783-7.
87. Albert O, Toubas D, Strady C, *et al.* Reactivity of (1→3)-β-D-Glucan assay in bacterial bloodstream infections. *Eur J Clin Microbiol Infect Dis.* 2011;30(11):1453-60.
88. Mohr JF, Sims C, Paetznick V, *et al.* Prospective survey of (1→3)-β-D-Glucan and its relationship to invasive candidiasis in the surgical intensive care unit setting. *J Clin Microbiol.* 2011;49(1):58-61.
89. Racil Z, Kocmanova I, Lengerova M, Weinbergerova B, Buresova L, Toskova M, Winterova J, Timilsina S, Rodriguez I, Mayer J, (2010). Difficulties in using (1→3)-β-D-glucan as the screening test for the early diagnosis of invasive fungal diseases in patients with hematological malignancies - high frequency of false positive results and their analysis. *J. Med. Microbiol.* 59:1016-22.
90. Mularoni A, Furfaro E, Faraci M, Franceschi A, Mezzano P, Bandettini R, Viscoli C, and Castagnola E, (2010). High Levels of beta-D-glucan in immunocompromised children with proven invasive fungal disease. *Clin. Vaccine Immunol.* 17:882-3.
91. Metan G, Agkus C, Buldu H, Koç AN, (2010). The interaction between piperacillin/tazobactam and assays for *Aspergillus* galactomannan and (1→3)-β-D-glucan in patients without risk factors for invasive fungal infections *Infection.* 38:217-21.
92. Alexander BD, Smith PB, Davis RD, Perfect JR, Reller LB. The (1,3)-β-D-glucan test as an aid to early diagnosis of invasive fungal infections following lung transplantation. *J Clin Microbiol.* 2010;48(11):4083-8.

93. Del Palacio A, Llenas-García J, Soledad Cuétara M, Pulido F, Rubio R, Pontón J, Del Palacio-Pérez-Medel A, (2010). Serum (1→3)-β-D-Glucan as a noninvasive adjunct marker for the diagnosis and follow-up of *Pneumocystis jirovecii* pneumonia in patients with HIV infection. Clin. Infect. Dis. 50:451-2.
94. Del Bono V, Mularoni A, Furfaro E, Delfino E, Rosasco L, Miletich F. and Viscoli C, (2009). clinical evaluation of (1→3)-β-D-Glucan assay in presumptive *Pneumocystis jirovecii* pneumonia in immunocompromised patients. Clin. Vacc. Immunol. 16: 1524-1526.
95. Rácil Z, Kocmanová I, Weinbergerová B, Winterová J, Lengerová M, Hrnčířová K, Mayer J, (2009). Detection of (1→3)-β-D-glucan for diagnosis of invasive fungal infections in hemato-oncological patients: usefulness for screening of invasive mycosis and for confirmation of galactomannan positive results]. Klin. Mikrobiol. Infekc. Lek. 15:48-57.
96. Ostrosky-Zeichner L, Paetznick VL, Rodriguez J, Chen E, and Sheehan DJ, (2009). Activity of anidulafungin in a murine model of *Candida krusei* infection: evaluation of mortality and disease burden by quantitative tissue cultures and measurement of serum (1→3)-β-D-glucan levels. Antimicrob. Agents Chemother. 53: 1639-1641.
97. Desmet S, Van Wijngaerden E, Maertens J, et al. Serum (1-3)-Beta-D-Glucan as a tool for diagnosis of *Pneumocystis jirovecii* pneumonia in patients with human immunodeficiency virus infection or hematological malignancy. J Clin Microbiol. 2009;47(12):3871-4.
98. Koo S, Bryar JM, Page JH, Baden LR, and Marty FM, (2009). Diagnostic performance of the (1→3)-β-D-glucan assay for invasive fungal disease. Clin. Infect. Dis. 49:1650-9.
99. Cuétara, M.S., Alhambra, A., Moragues, M.D., Gonzalez-Elorza, E., Ponton, J., and Del Palacio, A. (2009). Detection of (1g3)-b-D-glucan as an adjunct to diagnosis in a mixed population with uncommon proven fungal diseases or unusual clinical presentation. Clin. Vacc. Immunol. 16: 423-426
100. Wiederhold NP, Najvar LK, Vallor AC, Kirkpatrick WR, Bocanegra R, Molian D, Olivo M, Graybill JR, and Patterson TF, (2008). Assessment of (1→3)-β-D-glucan concentration as a measure of disease burden in a murine model of invasive pulmonary aspergillosis. Antimicrob. Agents Chemother. 52: 1176-1178.
101. Pisciulli ML, and Sax PE, (2008). Use of a Serum β-D-Glucan Assay for Diagnosis of HIV-Related *Pneumocystis jirovecii* Pneumonia in Patients with Negative Microscopic Examination Results. Clin. Infect. Dis. 46: 1928-1930.
102. Obayashi T, Negishi K, Suzuki T, and Funata N, (2008). Reappraisal of the serum (1→3)-β-D-glucan assay for the diagnosis of invasive fungal infections—a study based on autopsy cases from 6 years. Clin. Infect. Dis. 46: 1864-1870.
103. Kocmanová I, Rácil Z, Koukalová D, Mayer J, (2008). (1→3)-β-D-glucan measurement and its usefulness in the diagnosis of invasive fungal infections. Klin. Mikrobiol. Infekc. Lek. 14:88-92.
104. Ellis M, Al-Ramadi B, Finkelman M, et al. Assessment of the clinical utility of serial Beta-D-Glucan concentrations in patients with persistent neutropenic fever. J Med Microbiol. 2008;57(Pt 3):287-95.
105. Khan ZU, Ahmad S, Theyyathel AM. Detection of *Aspergillus fumigatus*-specific DNA, (1→3)-β-D-Glucan and galactomannan in serum and bronchoalveolar lavage specimens of experimentally infected rats. Mycoses. 2008;51(2):129-35.
106. Persat F, Ranque S, Derouin F, Michel-Nguyen A, Picot S, Sulahian A. Contribution of the (1→3)-β-D-Glucan assay for diagnosis of invasive fungal infections. J Clin Microbiol. 2008;46(3):1009-13.
107. Marty FM and Koo S, (2008). Role of (1→3)-β-D-Glucan in the diagnosis of invasive aspergillosis. Medical Mycology 47: Suppl. 1: S233-240
108. Smith PB, Benjamin DK, Alexander BD, Johnson MD, Finkelman MA, and Steinbach WJ, (2007). (1→3)-β-D-Glucan levels in pediatric patients: Preliminary data for the use of the beta-glucan test in children. Clin. Vaccine Immunol. 14: 924-925.
109. Marty FM, Koo S, Bryar J, and Baden LR, (2007). (1→3)-β-D-glucan assay positivity in patients with *Pneumocystis (carinii) jirovecii* pneumonia. Ann. Int. Med. 147:70-72.
110. Girouard G, Lachance C, Pelletier R, (2007). Observations on (1→3)-β-D-glucan detection as a diagnostic tool in endemic mycosis caused by *Histoplasma* or *Blastomyces*. J. Med. Microbiol. 56:1001-2.
111. Egan L, Connolly P, Wheat LJ, Fuller D, Davis TE, Knox KS and Hage CA, (2007). Histoplasmosis as a cause for a positive Fungitell® (1→3)-β-D-glucan test. Medical Mycology, 46:193-95.
112. Ahmad S, Khan ZU, Theyyathel AM. Diagnostic value of DNA, (1-3)-Beta-D-Glucan, and galactomannan detection in serum and bronchoalveolar lavage of mice experimentally infected with *Aspergillus terreus*. Diagn Microbiol Infect Dis. 2007;59(2):165-71.
113. Pazos C, Moragues MD, Quindos G, and del Palacio A, (2006). Diagnostic potential of (1→3)-β-D-glucan and anti-*Candida albicans* germ tube antibodies for the diagnosis and therapeutic monitoring of invasive candidiasis in neutropenic adult patients. Rev. Iberoam Micol. 23: 209-215.
114. Mennink-Kersten MA, Ruegebrink D, Wasei N, Melchers WJ, and Verweij PE, (2006). In vitro release by *Aspergillus fumigatus* of galactofuranose antigens, (1→3)-β-D-glucan, and DNA, surrogate markers used for diagnosis of invasive aspergillosis. J. Clin. Microbiol. 44:1711-8.
115. Odabasi Z, Paetznick VL, Rodriguez JR, Chen E, McGinnis MR, and Ostrosky-Zeichner L, (2006). Differences in beta-glucan levels in culture supernatants of a variety of fungi. Med. Mycol. 44:267-72.
116. Pazos C, Ponton J, and Del Palacio A, (2005). Contribution of (1→3)-β-D-glucan chromogenic assay to diagnosis and therapeutic monitoring of invasive aspergillosis in neutropenic adult patients: A comparison with serial screening for circulating galactomannan. Journal of Clinical Microbiology 43: 299-305.
117. Ostrosky-Zeichner L, Alexander BD, Kett DH, Vazquez J, Pappas PG, Saeki F, Ketchum PA, Wingard J, Schiff R, Tamura H, Finkelman MA, and Rex JH, (2005). Multicenter clinical evaluation of the (1→3)-β-D-glucan assay as an aid to diagnosis of fungal infections in humans. Clin. Inf. Dis. 41: 299-305.
118. Pickering JW, Sant HW, Bowles CA, Roberts WL, Woods GL. Evaluation of a (1→3)-β-D-Glucan assay for diagnosis of invasive fungal infections. J Clin Microbiol. 2005;43(12):5957-62.
119. Odabasi Z, Mattiuzzi G, Estey E, Kantarjian H, Saeki F, Ridge R, Ketchum P, Finkelman M, Rex J, and Ostrosky-Zeichner L, (2004). β-D-glucan as a diagnostic adjunct for invasive fungal infections: Validation, cutoff development, and performance in patients with Acute Myelogenous Leukemia and Myelodysplastic Syndrome. Clin. Inf. Dis. 39:199-205.

B. β-D-Glucan Kinetics

1. Träger J, Dräger S, Mihai S, et al. Detailed β-(1→3)-D-glucan and mannan antigen kinetics in patients with candidemia. J Clin Microbiol. 2023;61(11):e0059823.
2. Satish S, Jiménez-Ortigosa C, Zhao Y, et al. Stress-Induced Changes in the Lipid Microenvironment of β-(1,3)-d-Glucan Synthase Cause Clinically Important Echinocandin Resistance in *Aspergillus fumigatus*. mBio. 2019;10(3):e00779-19.
3. Szyzkowitz A, Zurl C, Herzog A, et al. Serum 1,3-Beta-D-Glucan Values During and After Laparoscopic and Open Intestinal Surgery. Open Forum Infect Dis. 2018;5(12):ofy296.
4. Pini P, Venturelli C, Girardis M, Forghieri F, Blasi E. Prognostic Potential of the Panfungal Marker (1→3)-β-D-Glucan in Invasive Mycoses Patients. Mycopathologia. 2019;184(1):147-50.
5. Guitard J, Isnard F, Tabone MD, et al. Usefulness of β-D-glucan for diagnosis and follow-up of invasive candidiasis in onco-haematological patients. J Infect. 2018;76(5):483-8.

6. Angebault C, Lanterrier F, Dalle F, *et al.* Prospective Evaluation of Serum β-Glucan Testing in Patients With Probable or Proven Fungal Diseases. *Open Forum Infect Dis.* 2016;3(3):ofw128.
7. Han S, Su X, Zhao R, Fang K. [The effect of albumin on (1,3)-β-D-glucan for diagnosis of invasive fungal infections]. *Zhonghua Wei Zhong Bing Ji Jiu Yi Xue.* 2015;27(8):672-6.
8. De Pascale G, Tumbarello M. Fungal infections in the ICU: advances in treatment and diagnosis. *Curr Opin Crit Care.* 2015;21(5):421-9.
9. Martín-Mazuelos E, Loza A, Castro C, *et al.* β-D-Glucan and *Candida albicans* germ tube antibody in ICU patients with invasive candidiasis. *Intensive Care Med.* 2015;41(8):1424-32.
10. Sims CR, *et al.* (2012). Correlation of clinical outcomes with b-glucan levels in patients with invasive candidiasis. *J. Clin. Microbiol.* 50:2104-2106.
11. Jaijakul S, *et al.* (2012). (1→3)-β-D-Glucan as a prognostic marker of treatment response in invasive candidiasis. *Clin. Inf. Dis.* 55: 521-526.
12. Hanson KE, Pfeiffer CD, Lease ED, *et al.* β-D-glucan surveillance with preemptive anidulafungin for invasive candidiasis in intensive care unit patients: a randomized pilot study. *PLoS One.* 2012;7(8):e42282.
13. Koo S, Baden LR, Marty FM. Post-diagnostic kinetics of the (1→3)-β-D-glucan assay in invasive aspergillosis, invasive candidiasis and *Pneumocystis jirovecii* pneumonia. *Clin Microbiol Infect.* 2012; 18(5):E122-7.
14. Mikulska M, Furfaro E, Del Bono V, Gualandi F, Van Lint MT, Miletich F, Bacigalupo A, and Viscoli C, (2011). Persistence of positive (1,3)-beta-glucan test after clearance of candidemia in HSCT recipients. *Clin. Vacc. Immunol.* 18: 518-519.
15. Held, J. and Wagner, D., (2011). β-D-Glucan kinetics for the assessment of treatment response in *Pneumocystis jirovecii* pneumonia. *Clin. Microbiol. Infect.* 17: 1118-1122.
16. Bellanger AP, Grenouillet F, Henon T, *et al.* Retrospective assessment of β-D-(1,3)-glucan for presumptive diagnosis of fungal infections. *APMIS.* 2011;119(4-5):280-6.
17. Ishikawa T, Takata T, Akamatsu S, *et al.* Analysis of *Candida glabrata* strains with reduced sensitivity to micafungin in vitro isolated from a patient with persistent Candidemia. *Jpn J Infect Dis.* 2010;63(5):332-7.
18. Hope WW, Petraitis V, Petraitiene R, Aghamolla T, Bacher J, Walsh TJ. The initial 96 hours of invasive pulmonary aspergillosis: histopathology, comparative kinetics of galactomannan and (1→3)-β-D-glucan and consequences of delayed antifungal therapy. *Antimicrob Agents Chemother.* 2010;54(11):4879-86.
19. Hachem RY, Kontoyannis DP, Chemaly RF, Jiang Y, Reitzel R, and Raad I, (2008). Utility of galactomannan enzyme immunoassay and (1→3)-β-D-glucan in diagnosis of invasive fungal infections: low sensitivity for *Aspergillus fumigatus* infection in hematologic malignancy patients. *J. Clin. Micro.* 47: 129-133.
20. Khan ZU, Ahmad S, Theyyathel AM. Detection of *Aspergillus fumigatus*-specific DNA, (1→3)-β-D-glucan and galactomannan in serum and bronchoalveolar lavage specimens of experimentally infected rats. *Mycoses.* 2008;51(2):129-35.
21. Khan ZU, Ahmad S, Theyyathel AM. Diagnostic value of DNA and (1→3)-β-D-glucan detection in serum and bronchoalveolar lavage of mice experimentally infected with *Fusarium oxysporum*. *J Med Microbiol.* 2008;57(Pt 1):36-42.
22. Yoshida K. [Recent advances of serodiagnosis for systemic fungal infections]. *Nihon Ishinkin Gakkai Zasshi.* 2006;47(3): 135-42.
2. Lamoth F, Nucci M, Fernandez-Cruz A, *et al.* Performance of the beta-glucan test for the diagnosis of invasive fusariosis and scedosporiosis: a meta-analysis. *Med Mycol.* 2023;61(7): myad061.
3. Singh S, Singh M, Verma N, *et al.* Comparative accuracy of 1,3 β-D-glucan and galactomannan for diagnosis of invasive fungal infections in pediatric patients: a systematic review with meta-analysis. *Med Mycol.* 2021;59(2):139-48.
4. Cohen JF, Ouziel A, Matczak S, *et al.* Diagnostic accuracy of serum (1,3)-β-D-glucan for neonatal invasive candidiasis: systematic review and meta-analysis. *Clin Microbiol Infect.* 2020;26(3):291-8.
5. Haydour Q, Hage CA, Carmona EM, *et al.* Diagnosis of Fungal Infections. A Systematic Review and Meta-Analysis Supporting American Thoracic Society Practice Guideline. *Ann Am Thorac Soc.* 2019;16(9):1179-88.
6. White SK, Walker BS, Hanson KE, Schmidt RL. Diagnostic Accuracy of β-D-Glucan (Fungitell®) Testing Among Patients With Hematologic Malignancies or Solid Organ Tumors: A Systematic Review and Meta-Analysis. *Am J Clin Pathol.* 2019;151(3):275-85.
7. Zhang L, Guo Z, Xie S, *et al.* The performance of galactomannan in combination with 1,3-β-D-glucan or aspergillus-lateral flow device for the diagnosis of invasive aspergillosis: Evidences from 13 studies. *Diagn Microbiol Infect Dis.* 2019;93(1):44-53.
8. Lehrnbecher T, Robinson PD, Fisher BT, *et al.* Galactomannan, β-D-Glucan, and Polymerase Chain Reaction-Based Assays for the Diagnosis of Invasive Fungal Disease in Pediatric Cancer and Hematopoietic Stem Cell Transplantation: A Systematic Review and Meta-Analysis. *Clin Infect Dis.* 2016;63(10):1340-8.
9. Shi XY, Liu Y, Gu XM, *et al.* Diagnostic value of (1→3)-β-D-glucan in bronchoalveolar lavage fluid for invasive fungal disease: A meta-analysis. *Respir Med.* 2016;117:48-53.
10. He S, Hang JP, Zhang L, Wang F, Zhang DC, Gong FH. A systematic review and meta-analysis of diagnostic accuracy of serum 1,3-β-D-glucan for invasive fungal infection: Focus on cutoff levels. *J Microbiol Immunol Infect.* 2015;48(4):351-61.
11. Karageorgopoulos DE, Qu JM, Korbila IP, Zhu YG, Vasileiou VA, Falagas ME. Accuracy of β-D-glucan for the diagnosis of *Pneumocystis jirovecii* pneumonia: a meta-analysis. *Clin Microbiol Infect.* 2013;19(1):39-49.
12. Lamoth F, Cruciani M, Mengoli C, *et al.* β-Glucan antigenemia assay for the diagnosis of invasive fungal infections in patients with hematological malignancies: a systematic review and meta-analysis of cohort studies from the Third European Conference on Infections in Leukemia (ECIL-3). *Clin Infect Dis.* 2012;54(5):633-43.
13. Lu Y, Chen YQ, Guo YL, Qin SM, Wu C, Wang K. Diagnosis of invasive fungal disease using serum (1→3)-β-D-glucan: a bivariate meta-analysis. *Intern Med.* 2011;50(22):2783-91.
14. Onishi A, Sugiyama D, Kogata Y, *et al.* Diagnostic accuracy of serum 1,3-β-D-glucan for *pneumocystis jirovecii* pneumonia, invasive candidiasis, and invasive aspergillosis: systematic review and meta-analysis. *J Clin Microbiol.* 2012;50(1):7-15.
15. Karageorgopoulos DE, Vouloumanou EK, Ntziora F, Michalopoulos A, Rafailidis PI, Falagas ME. β-D-glucan assay for the diagnosis of invasive fungal infections: a meta-analysis. *Clin Infect Dis.* 2011;52(6):750-70.

D. Additional Matrices (Research Use Only)

1. Yamini Tawde, Sourav Das, Shreya Singh, Soham Basak, Savitri Sharma, Amit Gupta, Shivaprakash M. Rudramurthy, Geetika Yadav, Anup Ghosh. Evaluation of Fungitell (1,3)-β-D-glucan assay in tear samples for rapid diagnosis of fungal keratitis. Crossref DOI link: <https://doi.org/10.1128/jcm.01200-24> Published Print: 2024-12-11
2. Kolomeyer AM, Murphy KM, Traband A, Frank I, Kim BJ. Beta-D-Glucan testing in patients with fungal endophthalmitis. *Retina.* 2018;38(4):650-9.

C. Fungitell® Meta-Analyses

1. Huang QY, Li PC, Yue JR. Diagnostic performance of serum galactomannan and β-D-glucan for invasive aspergillosis in suspected patients: A meta-analysis. *Medicine (Baltimore).* 2024;103(5):e37067.

- Bhaskaran A, Kabbani D, Singer LG, *et al.* (1,3)-β-D-Glucan in Bronchoalveolar Lavage of Lung Transplant Recipients for the Diagnosis of Invasive Pulmonary Aspergillosis. *Med Mycol.* 2017;55(2):173-9.
- Theel ES, Jespersen DJ, Iqbal S, *et al.* Detection of (1,3)-β-D-glucan in bronchoalveolar lavage and serum samples collected from immunocompromised hosts. *Mycopathologia.* 2013;175 (1-2):33-41.
- Khan ZU, Ahmad S, Theyyathel AM. Detection of *Aspergillus fumigatus*-specific DNA, (1→3)-β-D-glucan and galactomannan in serum and bronchoalveolar lavage specimens of experimentally infected rats. *Mycoses.* 2008;51(2):129-35.

E. Beta-Glucan Comparison Studies

- Yazdanpanah S, Rahbarmah M, Motamedi M, Khodadadi H. Evaluation of the Performance of the Dynamiker Fungus (1→3)-β-D-Glucan and Fungitell® Assay for Diagnosis of Candidemia: Need for New Cut-off Development and Test Validation. *Diagn Microbiol Infect Dis.* 2024;108(2):116118.
- Alanio A, Gits-Muselli M, Guigue N, *et al.* Prospective comparison of (1,3)-β-D-Glucan detection using colorimetric and turbidimetric assays for diagnosing invasive fungal disease. *Med Mycol.* 2021;59(9):882-9.
- Bamba Y, Nagano K, Moro H, *et al.* Efficacy of the new β-D-glucan measurement kit for diagnosing invasive fungal infections, as compared with that of four conventional kits. *PLoS One.* 2021;16(8): e0255172. Published 2021 Aug 26. doi:10.1371/journal.pone.0255172
- Song J, Kim S, Park J, Park Y, Kim HS. Comparison of two β-D-glucan assays for detecting invasive fungal diseases in immunocompromised patients. *Diagn Microbiol Infect Dis.* 2021;101(1):115415.
- Zubkowicz M, Held J, Baier M, *et al.* Clinical evaluation of two different (1,3)-β-D-Glucan assays for diagnosis of invasive fungal diseases: A retrospective cohort study. *Mycoses.* 2021;64 (2):212-9.
- De Carolis E, Marchionni F, Torelli R, *et al.* Comparative performance evaluation of Wako β-glucan test and Fungitell® assay for the diagnosis of invasive fungal diseases. *PLoS One.* 2020;15(7):e0236095.
- Mercier T, Guldentops E, Patteet S, Beuselinck K, Lagrou K, Maertens J. Beta-D-Glucan for Diagnosing *Pneumocystis Pneumonia*: a Direct Comparison between the Wako β-Glucan Assay and the Fungitell® Assay. *J Clin Microbiol.* 2019;57(6): e00322-19.
- Friedrich R, Rappold E, Bogdan C, Held J. Comparative Analysis of the Wako β-Glucan Test and the Fungitell® Assay for Diagnosis of Candidemia and *Pneumocystis jirovecii* Pneumonia. *J Clin Microbiol.* 2018;56(9):e00464-18.

F. Review Articles

- Lass-Flörl C, Samardzic E, Knoll M. Serology anno 2021-fungal infections: from invasive to chronic. *Clin Microbiol Infect.* 2021;27(9): 1230-1241. doi:10.1016/j.cmi.2021.02.005
- White LP, Price JS. Recent Advances and Novel Approaches in Laboratory-Based Diagnostic Mycology. *J Fungi (Basel).* 2021;7(1):41. Published 2021 Jan 11. doi:10.3390/jof7010041
- Fisher, B.T., (2013). The Role of Biomarkers for Diagnosis of and Therapeutic Decisions Related to Invasive Aspergillosis in Children. *Curr. Fungal Infect Rep.* 7:7-14.
- Finkelman, M.A., (2010). *Pneumocystis jirovecii* infection: Cell wall (1→3)-β-D-glucan: Biology and diagnostic utility. *Crit. Rev. Microbiol.* 36: 271-81.
- Ponton, J., (2009). Usefulness of biological markers in the diagnosis of invasive candidiasis. *Rev. Iberoam. Micol.* 26:8-14.

G. Clinical Guidelines

- Chen SC, Perfect J, Colombo AL, *et al.* Global guideline for the diagnosis and management of rare yeast infections: an initiative of the ECMM in cooperation with ISHAM and ASM [published correction appears in *Lancet Infect Dis.* 2021 Dec;21(12):e363. doi: 10.1016/ S1473-3099 (21)00589-2] [published correction appears in *Lancet Infect Dis.* 2024 Aug;24(8):e485. doi: 10.1016/S1473-3099(24)00433-X]. *Lancet Infect Dis.* 2021;21 (12):e375-e386. doi:10.1016/S1473-3099(21)00203-6
- Schelenz S, Barnes RA, Barton RC, *et al.* British Society for Medical Mycology best practice recommendations for the diagnosis of serious fungal diseases. *Lancet Infect Dis.* 2015;15(4):461-474. doi:10.1016/ S1473-3099(15)70006-X
- Kullberg, B.J. *et al.* (2011). European Expert opinion on the management of invasive candidiasis in adults. *Clin. Microbiol. Infect. Suppl.* 5: 1-12.
- Lortholary, O. *et al.* (2012) ESCMID* guideline for the diagnosis and management of Candida diseases 2012: diagnostic procedures. *Clin. Microbiol. Infect.* 18 (Suppl. 7): 9–18.
- Maschmeyer, G., *et al.* (2015). Diagnosis and antimicrobial therapy of lung infiltrates in febrile neutropenic patients (allogeneic SCT excluded): Updated guidelines of the infectious diseases working party of the German Society of Haematology and Oncology (DGHO). *Ann Oncol.* 2015;26:21-33.
- Marchetti, O., Lamothe, F., Mikulska, M., Viscoli, C., Verweij, P., Bretagne, S., (2011). ECIL recommendations for the use of biological markers for the diagnosis of invasive fungal diseases in leukemic patients and hematopoietic SCT recipients. *Bone Marrow Transplant.* 47: 846-54.
- Rhunke, M. *et al.* (2012). Diagnosis of invasive fungal infections in haematology and oncology guidelines from the Infectious Diseases Working Party in Haematology and Oncology of the German Society for Haematology and Oncology (AGIHO). *Ann Oncol.* 23:823-33.
- Rhodes, A., Evans, L.E., Alhazzani, W. *et al.* (2017). Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016. *Intensive Care Med.* 43:304-377.
- Segal, B.H. *et al.* (2008) Defining responses to therapy and study outcomes in clinical trials of invasive fungal diseases: Mycoses Study Group and European Organization for Research and Treatment of Cancer consensus criteria. *Clin. Inf. Dis.* 47:674-683

H. Fungitell STAT®

- Kritikos A, Caruana G, Poissy J, *et al.* Comparison of Three β-Glucan Tests for the Diagnosis of Invasive Candidiasis in Intensive Care Units. *J Clin Microbiol.* 2023;61(2):e0169122.
- White PL, Price JS, Backx M. Evaluation of the Performance of the Associates of Cape Cod STAT Assay for the Diagnosis of Invasive Fungal Disease in Critical-Care Patients with COVID-19. *J Clin Microbiol.* 2021;59(9):e0086921.
- D'Ordine RL, Garcia KA, Roy J, Zhang Y, Markley B, Finkelman MA. Performance characteristics of Fungitell STAT®, a rapid (1→3)-β-D-glucan single patient sample in vitro diagnostic assay. *Med Mycol.* 2021;59(1):41-9.

I. Miscellaneous

- Carr A, Colley P, Berhe M, Nguyen HL. Evaluating predictors of invasive candidiasis in patients with and without candidemia on micafungin. *Proc (Bayl Univ Med Cent).* 2018 Jan 2;31(1):30-34. doi: 10.1080/ 08998280. 2017. 1396164. eCollection 2018 Jan. Erratum in: *Proc (Bayl Univ Med Cent).* 2019 Apr 23;32(2):324. PubMed [citation] PMID: 29686548, PMCID: PMC5903500.
- Chibabhai V, Fadana V, Bosman N, Nana T. Comparative sensitivity of 1,3 β-D-glucan for common causes of candidaemia in South Africa. *Mycoses.*

- 2019 Aug 8. doi: 10.1111/myc.12982. [Epub ahead of print] PubMed [citation] PMID: 31393662
3. Della Pepa R, Cerchione C, Pugliese N, Colicchio R, Salvatore P, Sirignano C, Soscia E, Pagano L, Sanguinetti M, Pane F, Picardi M. Diagnostic-driven antifungal approach in neutropenic patients at high risk for chronic disseminated candidiasis: preliminary observations on the role of 1,3-β-D-glucan antigenemia and multiphasic contrast-enhanced computed tomography. *Support Care Cancer*. 2018 Jun;26(6):1691-1694. doi: 10.1007/s00520-018-4138-9. Epub 2018 Mar 9. No abstract available. PubMed [citation] PMID: 29523967.
4. Dichtl K, Seybold U, Wagener J. Serological biomarkers of candidemia: a retrospective evaluation of three assays. *Infection*. 2019 Apr;47(2): 217-224. doi: 10.1007/s15010-018-1224-3. Epub 2018 Sep 27. PubMed [citation] PMID: 30264200.
5. Farhour Z, Mehraj V, Chen J, Ramendra R, Lu H, Routy JP. Use of (1→3)-β-D-glucan for diagnosis and management of invasive mycoses in HIV-infected patients. *Mycoses*. 2018 Oct;61(10):718-722. doi: 10.1111/myc.12797. Epub 2018 Jul 5. Review. PubMed [citation] PMID: 29855088, PMCID: PMC6175469.
6. Fernández-Cruz A, Semiglia MA, Guinea J, Martínez-Jiménez MDC, Escribano P, Kwon M, Rodríguez-Macías G, Chamorro-de-Vega E, Rodríguez-González C, Navarro R, Galar A, Sánchez-Carrillo C, Díez-Martín JL, Muñoz P. A retrospective cohort of invasive fusariosis in the era of antimould prophylaxis. *Med Mycol*. 2019 Jun 24. pii: myz060. doi: 10.1093/mmy/myz060. [Epub ahead of print] PubMed [citation] PMID: 31231772
7. Fernandez-Silva, F., *et al.*, (2013). Evaluation of the Efficacies of Amphotericin B, Posaconazole, Voriconazole and Anidulafungin in a Murine Disseminated Infection by the Emerging Opportunistic Fungus *Sarocladium (Acremonium) kiliense*. *Antimicrob. Agents Chemother*. 57: 6265-9.
8. Friedrich R, Rappold E, Bogdan C, Held J. Comparative Analysis of the Wako β-Glucan Test and the Fungitell® Assay for Diagnosis of Candidemia and *Pneumocystis jirovecii* Pneumonia. *J Clin Microbiol*. 2018 Aug 27;56(9). pii: e00464-18. doi: 10.1128/JCM.00464-18. Print 2018 Sep. PubMed [citation] PMID: 29899003, PMCID: PMC6113455.
9. Gianella S, Letendre SL, Iudicello J, Franklin D, Gauvin T, Zhang Y, Porrachia M, Vargas-Meneses M, Ellis RJ, Finkelman M, Hoenigl M. Plasma (1→3)-β-D-glucan and suPAR levels correlate with neurocognitive performance in people living with HIV on antiretroviral therapy: a CHARTER analysis. *J Neurovirol*. 2019 Jul 11. doi:10.1007/s13365-019-00775-6. [Epub ahead of print] PubMed [citation] PMID:31297727
10. Guitard J, Tabone MD, Senghor Y, Cros C, Moissenet D, Markowicz K, Valin N, Leverger G, Hennequin C. Detection of β-D-glucan for the diagnosis of invasive fungal infection in children with hematological malignancy. *J Infect*. 2016 Dec;73(6):607-615. doi: 10.1016/j.jinf.2016. 07.007. Epub 2016 Jul 22. PubMed [citation] PMID: 27452196
11. Guitard J, Isnard F, Tabone MD, Antignac M, Brissot E, Senghor Y, Petit A, Leverger G, Hennequin C. Usefulness of β-D-glucan for diagnosis and follow-up of invasive candidiasis in onco-haematological patients. *J Infect*. 2018 May;76(5):483-488. doi: 10.1016/j.jinf.2018. 01.011. Epub 2018 Feb 9. PubMed [citation] PMID: 29432826.
12. Hale, T.W., Bateman, T.L., Finkelman, M.A. and Berens, P.D., (2009). The absence of *Candida albicans* in milk samples of women with symptoms of ductal candidiasis. *Breastfeeding Med*. 4: 57-61.
13. Hartl B, Zeller I, Manhart A, Selitsch B, Lass-Flörl C, Willinger B. A Retrospective Assessment of Four Antigen Assays for the Detection of Invasive Candidiasis Among High-Risk Hospitalized Patients. *Mycopathologia*. 2018 Jun;183(3):513-519. doi: 10.1007/s 11046-017-0238-1. Epub 2018 Jan 22. PubMed [citation] PMID: 29356937, PMCID: PMC5958149.
14. Hoenigl M, de Oliveira MF, Pérez-Santiago J, Zhang Y, Woods SP, Finkelman M, Gianella S. Correlation of (1→3)-β-D-glucan with other inflammation markers in chronically HIV infected persons on suppressive antiretroviral therapy. *GMS Infect Dis*. 2015;3. pii: Doc3. Epub 2015 Dec 22. PubMed [citation] PMID: 27917362, PMCID: PMC5132183
15. Hoenigl M, Pérez-Santiago J, Nakazawa M, de Oliveira MF, Zhang Y, Finkelman MA, Letendre S, Smith D, Gianella S. (1→3)-β-D-Glucan: A Biomarker for Microbial Translocation in Individuals with Acute or Early HIV Infection? *Front Immunol*. 2016 Oct 3;7:404. eCollection 2016. PubMed [citation] PMID: 27752257, PMCID: PMC5046804
16. Hoenigl M, de Oliveira MF, Pérez-Santiago J, Zhang Y, Morris S, McCutchan AJ, Finkelman M, Marcotte TD, Ellis RJ, Gianella S. (1→3)-β-D-Glucan Levels Correlate With Neurocognitive Functioning in HIV-Infected Persons on Suppressive Antiretroviral Therapy: A Cohort Study. *Medicine (Baltimore)*. 2016 Mar;95(11): e3162. doi:10.1097/MD.0000000000003162. Erratum in: *Medicine (Baltimore)*. 2016 May 20;95(20):e9582. PubMed [citation] PMID: 26986173, PMCID: PMC4839954
17. Hoenigl M, Moser C, Funderburg N, Bosch R, Kantor A, Zhang Y, Eugen-Olsen J, Finkelman M, Reiser J, Landay A, Moisi D, Lederman MM, Gianella S; ACTG NWCS 411 study team. Soluble Urokinase Plasminogen Activator Receptor (suPAR) is predictive of Non-AIDS Events during Antiretroviral Therapy-mediated Viral Suppression. *Clin Infect Dis*. 2018 Nov 12. doi: 10.1093/cid/ciy966. [Epub ahead of print] PubMed [citation] PMID: 30418519, PMCID: PMC6669298.
18. Kondori, N., Edebo, L., and Mattsby-Baltzer, I., (2004). Circulating (1→3)-β-D-glucan and Immunoglobulin G subclass antibodies to *Candida albicans* cell wall antigens in patients with systemic candidiasis. *Clinical and diagnostic Laboratory Immunology*. 11(2):344-350.
19. McKeating C, White PL, Posso R, Palmer M, Johnson E, McMullan R. Diagnostic accuracy of fungal PCR and β-D-glucan for detection of candidaemia: a preliminary evaluation. *J Clin Pathol*. 2018 May;71(5):420-424. doi: 10.1136/jclinpath-2017-204692. Epub 2017 Sep 28. PubMed [citation] PMID: 28970296.
20. Mehraj V, Ramendra R, Isnard S, Dupuy FP, Ponte R, Chen J, Kema I, Jenabian MA, Costiniuk C, Lebouché B, Thomas R, Coté P, Leblanc R, Baril JG, Durand M, Chartrand-Lefebvre C, Tremblay C, Ancuta P, Bernard NF, Sheppard DC, Routy JP; Montreal Primary HIV-infection Study and Canadian HIV and Aging Cohort Study Groups.. Circulating (1→3)-β-D-Glucan is associated with immune activation during HIV infection. *Clin Infect Dis*. 2019 Mar 16. pii: ciz212. doi: 10.1093/cid/ ciz212. [Epub ahead of print] PubMed [citation] PMID: 30877304.
21. Mehraj V, Ramendra R, Isnard S, Dupuy FP, Lebouché B, Costiniuk C, Thomas R, Szabo J, Baril JG, Trottier B, Coté P, LeBlanc R, Durand M, Chartrand-Lefebvre C, Kema I, Zhang Y, Finkelman M, Tremblay C, Routy JP. CXCL13 as a Biomarker of Immune Activation During Early and Chronic HIV Infection. *Front Immunol*. 2019 Feb 21;10:289. doi: 10.3389/ fimmu.2019.00289. eCollection 2019. PubMed [citation] PMID: 30846990, PMCID: PMC6393370.
22. Mitchell, K.F. *et al.*, (2013). Role of Matrix β-1,3 Glucan in Antifungal Resistance of Non-*albicans Candida* Biofilms. *Antimicrob. Agents Chemother*. 57: 1918-1920.
23. Myint T, Chow FC, Bloch KC, Raymond-Guillen L, Davis TE, Wright PW, Woc-Colburn L, Khairy RN, Street AC, Yamamoto T, Albers A, Wheat LJ, Hage CA. Detection of (1→3)-β-D-Glucan in Cerebrospinal Fluid in Histoplasma Meningitis. *J Clin Microbiol*. 2018 Sep 25;56(10). pii: e00663-18. doi: 10.1128/JCM.00663-18. Print 2018 Oct. PubMed [citation] PMID: 30021828, PMCID: PMC6156302.
24. Passos AIM, Dertkigil RP, Ramos MC, Busso-Lopes AF, Tararan C, Ribeiro EO, Schreiber AZ, Trabasso P, Resende MR, Moretti ML. Serum markers as an aid in the diagnosis of pulmonary fungal infections in AIDS patients.

- Braz J Infect Dis. 2017 Nov - Dec;21(6):606-612. doi:10.1016/j.bjid.2017.07.002. Epub 2017 Jul 29. PubMed [citation] PMID: 28759746
25. Petraitiene, R., Petraitis, V., Hope, W.W., Mickiene, D., Kelaher, A.M., Murray, H.A., Mya-San, C., Hughes, J.E., Cotton, M.P., Bacher, J. and Walsh, T.J., (2008). CSF and Plasma (1→3)-β-D-glucan as surrogate markers for detection and therapeutic response of experimental hematogenous *Candida meningoencephalitis*. *Antimicrobial Agents and Chemotherapy*. 52: 4121-4129.
26. Picardi M, Della Pepa R, Giordano C, Pugliese N, Mortaruolo C, Trastulli F, Grimaldi F, Zacheo I, Raimondo M, Sirignano C, Salvatore P, Pane F. (1→3)-β-D-Glucan serum increase and small-airway-invasive radiological findings as early signs of pulmonary aspergillosis in high-risk hematologic patients in the posaconazole era: preliminary observations. *Ann Hematol*. 2019 Feb;98(2):527-531. doi: 10.1007/s00277-018-3441-3. Epub 2018 Jul 23. No abstract available. PubMed [citation] PMID: 30033485.
27. Pini P, Colombari B, Marchi E, Castagnoli A, Venturelli C, Sarti M, Blasi E. Performance of *Candida albicans* germ tube antibodies (CAGTA) and its association with (1→3)-β-D-glucan (BDG) for diagnosis of invasive candidiasis (IC). *Diagn Microbiol Infect Dis*. 2019 Jan;93(1):39-43. doi:10.1016/j.diagmicrobio.2018.07.007. Epub 2018 Aug 8. No abstract available. Erratum in: *Diagn Microbiol Infect Dis*. 2019 Jun;94(2):211. PubMed [citation] PMID: 30098849.
28. Ramendra R, Isnard S, Mehraj V, Chen J, Zhang Y, Finkelman M, Routy JP. Circulating LPS and (1→3)-β-D-Glucan: A Folie à Deux Contributing to HIV-Associated Immune Activation. *Front Immunol*. 2019 Mar 18;10:465. doi: 10.3389/fimmu.2019.00465. eCollection 2019. Review. PubMed [citation] PMID: 30967860, PMCID: PMC6430738
29. Sav. H., *et al.*, (2012). The importance of bronchoalveolar lavage (BAL) sample for galactomannan, (1→3)-β-D-glucan and PCR tests. *Mikrobiyol. Bul.* 46: 695-701.
30. Schelenz S, Owens K, Guy R, Rautemaa-Richardson R, Manuel RJ, Richardson M, Moore C, Enoch DA, Micallef C, Howard P, Agrawal SG, Johnson EM, Muller-Pebody B; English Surveillance Programme for Antimicrobial Utilisation and Resistance (ESPAUR).. National mycology laboratory diagnostic capacity for invasive fungal diseases in 2017: Evidence of sub-optimal practice. *J Infect*. 2019 Aug;79(2): 167-173. doi: 10.1016/j.jinf.2019.06.009. Epub 2019 Jun 21. PubMed [citation] PMID: 31233810.
31. Shupp, J.W., Petraitiene, R., Jaskille, A.D., Pavlovich, A.R., Matt, S.E., Nguyen, D.T., Kath, M.A., Jeng, J.C., Jordan, M.H., Finkelman, M., Walsh, T.J., Shoham, S., (2011). Early serum (1→3)-β-D-glucan levels in patients with burn injury. *Mycoses* 55:224-7.
32. Singh S, Kaur H, Choudhary H, Sethi S, Malhotra P, Gupta KL, Rudramurthy SM, Chakrabarti A. Evaluation of biomarkers: Galactomannan and 1,3-beta-D-glucan assay for the diagnosis of invasive fungal infections in immunocompromised patients from a tertiary care centre. *Indian J Med Microbiol*. 2018 Oct-Dec;36(4):557-563. doi:10.4103/ijmm. IJMM_18_366. PubMed [citation] PMID: 30880706.
33. Talento AF, Dunne K, Joyce EA, Palmer M, Johnson E, White PL, Springer J, Loeffler J, Ryan T, Collins D, Rogers TR. A prospective study of fungal biomarkers to improve management of invasive fungal diseases in a mixed specialty critical care unit. *J Crit Care*. 2017 Aug;40:119-127. doi: 10.1016/j.jccr.2017.03.025. Epub 2017 Mar 30. PubMed [citation] PMID: 28384600
34. Tasaka, S. and Tokuda, H., (2012). *Pneumocystis jirovecii* pneumonia in non-HIV-infected patients in the era of novel immunosuppressive therapies. *J. Infect. Chemother.* 18(6):793-806.
35. Vargas, S.A., *et al.*, (2013). Near-universal prevalence of *Pneumocystis* and associated increase in mucus in the lungs of infants with sudden unexpected death. *Clin. Inf. Dis.* 56: 171-179.