



SOCIETY OF INFECTIOUS  
DISEASES PHARMACISTS

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## 30 Years of SIDP Research

*In order to highlight the research contributions of SIDP members, we have compiled 30 research papers published over the past 30 years. These were selected from research publications supported by SIDP grants or awards, or were produced from members with key roles in SIDP. These represent a small "sampling over time" of the breadth of research accomplishments from our membership.*

### 1992

Founding member and past SIDP President **Michael Dudley** reports findings from a pharmacokinetic study of stavudine, a "new antiretroviral" in patients with AIDS.

Dudley MN, Graham KK, Kaul S, Geletko S, Dunkle L, Browne M, Mayer K. Pharmacokinetics of stavudine in patients with AIDS or AIDS-related complex. *J Infect Dis.* 1992 Sep;166(3):480-5. doi: 10.1093/infdis/166.3.480. PMID: 1323615.

### 1993

Founding members and past SIDP Presidents **John Bosso and Ronald Prince** performed a pharmacokinetic study of cefepime, providing critical dosing information for individuals with cystic fibrosis against *Pseudomonas aeruginosa*.

Huls CE, Prince RA, Seilheimer DK, Bosso JA. Pharmacokinetics of cefepime in cystic fibrosis patients. *Antimicrob Agents Chemother.* 1993 Jul;37(7):1414-6. doi: 10.1128/AAC.37.7.1414. PMID: 8363368; PMCID: PMC187985.

### 1994

Past SIDP President **Peggy Carver** and colleagues performed a drug-drug interaction study between ketoconazole and sucralfate. Their findings supported a dose separation of at least 12 hours with concurrent administration.

Carver PL, Berardi RR, Knapp MJ, Rider JM, Kauffman CA, Bradley SF, Atassi M. In vivo interaction of ketoconazole and sucralfate in healthy volunteers. *Antimicrob Agents Chemother.* 1994 Feb;38(2):326-9. doi: 10.1128/AAC.38.2.326. PMID: 7910724; PMCID: PMC284448.

### 1995

**Michael Rybak**, past SIDP President, and colleagues evaluated continuous-infusion ceftazidime dosing compared to conventional intermittent bolus dosing when given with a single daily-dose of amikacin. The authors' in vitro infection model provided dosing strategies for both susceptible and resistant *Pseudomonas* strains.

Cappelletty DM, Kang SL, Palmer SM, Rybak MJ. Pharmacodynamics of ceftazidime administered as continuous infusion or intermittent bolus alone and in combination with single daily-dose amikacin

against *Pseudomonas aeruginosa* in an in vitro infection model. Antimicrob Agents Chemother. 1995 Aug;39(8):1797-801. doi: 10.1128/AAC.39.8.1797. PMID: 7486921; PMCID: PMC162828.

### 1996

**Guy Amsden**, 1996 SIDP Young Investigator Awardee, used data from critically ill patients treated with intravenous ciprofloxacin to prospectively validate a previously developed maximum a posteriori (MAP)-Bayesian estimator and optimal plasma-sampling strategy. These data demonstrated the usefulness and validity of the current OSS and MAP-Bayesian estimator, and provided further evidence of the utility of optimal sampling theory.

Amsden GW, Ballow CH. Prospective validation of an optimal sparse plasma-sampling strategy for estimating ciprofloxacin pharmacokinetics. Pharmacotherapy. 1996 Sep-Oct;16(5):937-41. PMID: 8888090.

### 1998

1995 SIDP Young Investigator Awardee **Mark Shelton** identified that previous infection with *Helicobacter pylori* was the primary determinant of spontaneous gastric hypoacidity in outpatients with HIV.

Shelton MJ, Adams JM, Hewitt RG, Morse GD. Previous infection with *Helicobacter pylori* is the primary determinant of spontaneous gastric hypoacidity in human immunodeficiency virus-infected outpatients. Clin Infect Dis. 1998 Oct;27(4):739-45. doi: 10.1086/514933. PMID: 9798026.

### 1999

**Peggy McKinnon**, an SIDP leader and mentor, and **Melinda Neuhauser**, past SIDP President, performed an efficacy and cost analysis to find that ampicillin-sulbactam provides effective coverage for patients with the above infections and is as effective as ticarcillin-calvulanate.

McKinnon PS, Neuhauser MM. Efficacy and cost of ampicillin-sulbactam and ticarcillin-clavulanate in the treatment of hospitalized patients with bacterial infections. Pharmacotherapy. 1999 Jun;19(6):724-33. doi: 10.1592/phco.19.9.724.31537. PMID: 10391418.

### 2000

**Roger White**, 1995 SIDP Pfizer Research Awardee, and co-authors examined relationships between antimicrobial usage and susceptibility over a 5-year period within one academic health center. The authors found different patterns within specific units of the hospital and advocated for unit-specific monitoring and reporting of drug use and susceptibilities.

White RL, Friedrich LV, Mihm LB, Bosso JA. Assessment of the relationship between antimicrobial usage and susceptibility: differences between the hospital and specific patient-care areas. Clin Infect Dis. 2000 Jul;31(1):16-23. doi: 10.1086/313916. Epub 2000 Jul 14. PMID: 10913390.

### 2002

**Michael Klepser**, recipient of the 2000 Young Investigator Award, and past SIDP president evaluated amphotericin B, flucytosine, fluconazole, and voriconazole alone and in combination against isolates of *Candida lusitanae*. Amphotericin B resulted in fungicidal activity against most isolates, whereas fluconazole, voriconazole, and flucytosine produced primarily fungistatic activities. The addition of flucytosine to amphotericin B also resulted in a faster rate and greater extent of kill for isolates.

Ernst EJ, Yodoi K, Roling EE, Klepser ME. Rates and extents of antifungal activities of amphotericin B, flucytosine, fluconazole, and voriconazole against *Candida lusitanae* determined by microdilution,

Etest, and time-kill methods. *Antimicrob Agents Chemother.* 2002 Feb;46(2):578-81. doi: 10.1128/AAC.46.2.578-581.2002. PMID: 11796383; PMCID: PMC127046.

### 2003

**George Allen**, 2000 recipient of SIDP Bayer/Smithkline Research Grant examined the activities of mutant prevention concentration-targeted moxifloxacin and levofloxacin against *Streptococcus pneumoniae* in an *in vitro* pharmacodynamic model.

Allen GP, Kaatz GW, Rybak MJ. Activities of mutant prevention concentration-targeted moxifloxacin and levofloxacin against *Streptococcus pneumoniae* in an *in vitro* pharmacodynamic model. *Antimicrob Agents Chemother.* 2003 Aug;47(8):2606-14.

### 2005

With a 2000 SIDP Pfizer Research Grant, **Erika Ernst** (a past SIDP President) evaluated the impact of resistance on the clinical outcomes in patients with acute uncomplicated cystitis.

Ernst EJ, Ernst ME, Hoehns JD, Bergus GR. Women's quality of life is decreased by acute cystitis and antibiotic adverse effects associated with treatment. *Health Qual Life Outcomes.* 2005 Jul 27;3:45. doi: 10.1186/1477-7525-3-45. PMID: 16048650; PMCID: PMC1183236.

### 2006

**Elizabeth Dodds Ashley**, 2003 SIDP Abbott Research awardee and past SIDP President, and colleagues prospectively evaluated the safety and tolerability of aerosolized amphotericin B lipid complex in subjects undergoing allogeneic hematopoietic stem cell transplantation in an open-labeled, non-comparative study. This novel formulation was well-tolerated with minimal side effects, promoting its potential investigation for antifungal prophylaxis in this population.

Alexander BD, Dodds Ashley ES, Addison RM, Alspaugh JA, Chao NJ, Perfect JR. Non-comparative evaluation of the safety of aerosolized amphotericin B lipid complex in patients undergoing allogeneic hematopoietic stem cell transplantation. *Transpl Infect Dis.* 2006 Mar;8(1):13-20. doi: 10.1111/j.1399-3062.2006.00125.x. PMID: 16623816.

### 2007

**Mary Hayney**, 2004 SIDP Bayer Research Grant awardee, performed a prospective study in lung transplant recipients to evaluate T-cell responses following hepatitis B vaccination. They found that while antibody concentrations waned, T-cell responses were maintained similar to healthy subjects.

Hayney MS, Wiegert NA, Pelsue FL, Fohl RM, Jankowska-Gan E, Love RB, Burlingham WJ. T-cell responses to hepatitis B surface antigen in lung transplant recipients. *Pharmacotherapy.* 2007 Sep;27(9):1248-52. doi: 10.1592/phco.27.9.1248. PMID: 17723078.

### 2008

**Manjunath Pai**, 2005 SIDP Pfizer Grant awardee and 2007 Young Investigator Awardee, investigated the effects of combinations of flucytosine, micafungin, and voriconazole against *Candida*-infected human platelet-fibrin clots, used as simulated endocardial vegetations. The findings that flucytosine and micafungin were superior in rates and extents of fungal burden reduction compared to voriconazole were supportive of further evaluation in animal models of *Candida* endocarditis.

Pai MP, Samples ML, Mercier RC, Spilde MN. Activities and ultrastructural effects of antifungal combinations against simulated *Candida* endocardial vegetations. *Antimicrob Agents Chemother.* 2008 Jul;52(7):2367-76. doi: 10.1128/AAC.01557-07. Epub 2008 Apr 21. PMID: 18426896; PMCID: PMC2443905.

**Sarah Robertson**, 2005 SIDP Pfizer Research Grant recipient, used bupropion as a marker for CYP2b6 activity and found that efavirenz induces CYP2B6 enzyme activity *in vivo*.

Robertson SM, Maldarelli F, Natarajan V, Formentini E, Alfaro RM, Penzak SR. Efavirenz induces CYP2B6-mediated hydroxylation of bupropion in healthy subjects. *J Acquir Immune Defic Syndr*. 2008 Dec 15;49(5):513-9. doi: 10.1097/QAI.0b013e318183a425. PMID: 18989234.

### 2009

**Tom Lodise**, 2003 Wyeth Research Award recipient and 2008 SIDP Young Investigator awardee, and colleagues reported outcomes of extended infusion piperacillin/tazobactam for gram-negative infections. Mortality and length of stay were similar to intermittent dosing.

Patel GW, Patel N, Lat A, Trombley K, Enbawe S, Manor K, Smith R, Lodise TP Jr. Outcomes of extended infusion piperacillin/tazobactam for documented Gram-negative infections. *Diagn Microbiol Infect Dis*. 2009 Jun;64(2):236-40. doi: 10.1016/j.diagmicrobio.2009.03.002. PMID: 19500529.

### 2010

**Dave Feola**, 2007 SIDP Research Grant awardee, tested whether azithromycin affects the macrophage activation status and migration in the lungs of *Pseudomonas aeruginosa*-infected mice. The findings suggested that the immunomodulatory effects of azithromycin were associated with the induction of alternative and regulatory macrophage activation characteristics and alteration of cellular compartmentalization during infection.

Feola DJ, Garvy BA, Cory TJ, Birket SE, Hoy H, Hayes D Jr, Murphy BS. Azithromycin alters macrophage phenotype and pulmonary compartmentalization during lung infection with *Pseudomonas*. *Antimicrob Agents Chemother*. 2010 Jun;54(6):2437-47. doi: 10.1128/AAC.01424-09. Epub 2010 Mar 15. PMID: 20231397; PMCID: PMC2876369.

### 2011

**Ron Polk**, an SIDP founding member and past SIDP President, and his co-authors performed an analysis to benchmark adult antibacterial drug to expected use adjusted for patient mix, and outlier hospitals were identified. Differences between expected and observed use reflect usage patterns that were benchmarked and are targets for evaluation and intervention.

Polk RE, Hohmann SF, Medvedev S, Ibrahim O. Benchmarking risk-adjusted adult antibacterial drug use in 70 US academic medical center hospitals. *Clin Infect Dis*. 2011 Dec;53(11):1100-10. doi: 10.1093/cid/cir672. Epub 2011 Oct 13. PMID: 21998281.

### 2012

**Warren Rose**, 2009 SIDP Astellas Research Grant awardee and 2013 Young Investigator awardee, found that longer durations of antibiotic exposure resulted in substantial increases in key envelope response gene expression in vancomycin-tolerant MRSA, suggesting that while still susceptible, these strains have altered gene regulation to adapt to the antimicrobial effects of glyco- and lipopeptides that may emerge during prolonged durations of exposure.

Rose WE, Fallon M, Moran JJ, Vanderloo JP. Vancomycin tolerance in methicillin-resistant *Staphylococcus aureus*: influence of vancomycin, daptomycin, and telavancin on differential resistance gene expression. *Antimicrob Agents Chemother*. 2012 Aug;56(8):4422-7. doi: 10.1128/AAC.00676-12. Epub 2012 Jun 11. PMID: 22687502; PMCID: PMC3421561.

### 2013

**Julie Dumond**, 2009 SIDP Young Investigator Research Grant awardee, performed pilot pharmacokinetic studies and found that pharmacokinetic profiles of common antiretroviral regimens differ in older individuals with HIV compared to the general population.

Dumond JB, Adams JL, Prince HM, Kendrick RL, Wang R, Jennings SH, Malone S, White N, Sykes C, Corbett AH, Patterson KB, Forrest A, Kashuba AD. Pharmacokinetics of two common antiretroviral regimens in older HIV-infected patients: a pilot study. *HIV Med.* 2013 Aug;14(7):401-9. doi: 10.1111/hiv.12017. Epub 2013 Feb 24. PMID: 23433482; PMCID: PMC3664258.

### 2014

**Stephanie Flowers**, 2009 SIDP Astellas Research Grant awardee, sequenced ERG11 in 63 fluconazole-resistant *Candida albicans* clinical isolates. Identified mutations were then evaluated *in vitro* for susceptibilities to fluconazole, itraconazole, and voriconazole. These findings indicated that mutations in ERG11 were prevalent among azole-resistant clinical isolates and that most mutations resulted in appreciable changes in fluconazole and voriconazole susceptibilities.

Flowers SA, Colón B, Whaley SG, Schuler MA, Rogers PD. Contribution of clinically derived mutations in ERG11 to azole resistance in *Candida albicans*. *Antimicrob Agents Chemother.* 2015 Jan;59(1):450-60. doi: 10.1128/AAC.03470-14. Epub 2014 Nov 10. PMID: 25385095; PMCID: PMC4291385.

**Amy Pakyz**, past SIDP Board Member, used a multilevel model to identify medication risk factors associated with healthcare-associated *Clostridioides difficile* infection among 64 US academic medical centers.

Pakyz AL, Jawahar R, Wang Q, Harpe SE. Medication risk factors associated with healthcare-associated *Clostridium difficile* infection: a multilevel model case-control study among 64 US academic medical centres. *J Antimicrob Chemother.* 2014 Apr;69(4):1127-31. doi: 10.1093/jac/dkt489. PMID: 24327619.

### 2015

**Kristin Darin**, 2010 Young Investigator Research Grant recipient, performed this cross-sectional study to assess consumers' interest in pharmacy-based HIV screening services. This study found high interest in consumers from groups representing those disproportionately affected by HIV and also identified barriers to implementation.

Darin KM, Scarsi KK, Klepser DG, Klepser SA, Reeves A, Young M, Klepser ME. Consumer interest in community pharmacy HIV screening services. *J Am Pharm Assoc (2003).* 2015 Jan-Feb;55(1):67-72. doi: 10.1331/JAPhA.2015.14069. PMID: 25414989.

### 2016

**Betsy Hirsch**, 2012 Young Investigator Researcher Grant awardee, compared susceptibilities of multidrug-resistant gram-negative urine isolates to different oral antibiotics. This study found fosfomycin and nitrofurantoin were most active while empirical use of sulfamethoxazole-trimethoprim, ciprofloxacin, and ampicillin likely provided inadequate coverage in areas with a high prevalence of multidrug-resistant uropathogens.

Hirsch EB, Zucchi PC, Chen A, Raux BR, Kirby JE, McCoy C, Eliopoulos GM. Susceptibility of Multidrug-Resistant Gram-Negative Urine Isolates to Oral Antibiotics. *Antimicrob Agents Chemother.* 2016 Apr 22;60(5):3138-40. doi: 10.1128/AAC.02961-15. PMID: 26883704; PMCID: PMC4862536.

## 2017

**Joseph Kuti**, 2016 bioMérieux awardee and past SIDP President, and colleagues assessed time to detection and growth of two *Pseudomonas aeruginosa* isolates in the presence of clinically meaningful concentrations of these antibiotics. Study findings suggested that to minimize false-negative blood culture results for patients already receiving these antibiotics, cultures should be collected just prior to the next dose, when antibiotic concentrations are lowest.

Grupper M, Nicolau DP, Aslanzadeh J, Tanner LK, Kuti JL. Effects of Clinically Meaningful Concentrations of Antipseudomonal  $\beta$ -Lactams on Time to Detection and Organism Growth in Blood Culture Bottles. *J Clin Microbiol*. 2017 Dec;55(12):3502-3512. doi: 10.1128/JCM.01241-17. Epub 2017 Oct 11. PMID: 29021155; PMCID: PMC5703815.

**Joseph Carreno**, 2014 SIDP Research Award recipient, performed a pilot study to demonstrate proof of concept for a Bayesian approach to estimate vancomycin exposure in obese patients with a sparse pharmacokinetic sampling strategy.

Carreno JJ, Lomaestro B, Tietjan J, Lodise TP. Pilot Study of a Bayesian Approach To Estimate Vancomycin Exposure in Obese Patients with Limited Pharmacokinetic Sampling. *Antimicrob Agents Chemother*. 2017 Apr 24;61(5):e02478-16. doi: 10.1128/AAC.02478-16. PMID: 28289024; PMCID: PMC5404576.

## 2018

**Emily Heil**, 2015 SIDP Young Investigator Research Grant awardee, performed a prospective study to evaluate a PK/PD dosing calculator and found it had a 90% success rate of target attainment for cefepime, meropenem, and piperacillin-tazobactam in critically ill patients

Heil EL, Nicolau DP, Farkas A, Roberts JA, Thom KA. Pharmacodynamic Target Attainment for Cefepime, Meropenem, and Piperacillin-Tazobactam Using a Pharmacokinetic/Pharmacodynamic-Based Dosing Calculator in Critically Ill Patients. *Antimicrob Agents Chemother*. 2018 Aug 27;62(9):e01008-18. doi: 10.1128/AAC.01008-18. PMID: 29967022; PMCID: PMC6125501.

## 2019

**Gregory Tallman**, 2017 SIDP Ocean Spray Research Award recipient, and colleagues performed a national, multicenter study that identified a large number of antibiotics prescribed without documented indication. The study also identified factors associated with this practice which can be used to develop targeted interventions.

Ray MJ, Tallman GB, Bearden DT, Elman MR, McGregor JC. Antibiotic prescribing without documented indication in ambulatory care clinics: national cross sectional study. *BMJ*. 2019 Dec 11;367:l6461. doi: 10.1136/bmj.l6461. PMID: 31826860; PMCID: PMC7190070.

## 2020

**Amelia Sofjan**, 2016 SIDP Alere Award recipient, reported on the molecular epidemiology of toxigenic *Clostridioides difficile* isolates from hospitalized patients and hospital environment in Bangladesh.

Sofjan AK, Islam MA, Halder K, Kabir ND, Saleh AA, Miranda J, Lancaster C, Begum K, Alam MJ, Garey KW. Molecular epidemiology of toxigenic *Clostridioides difficile* isolates from hospitalized patients and the hospital environment in Dhaka, Bangladesh. *Anaerobe*. 2020 Feb;61:102081. doi: 10.1016/j.anaerobe.2019.102081. Epub 2019 Jul 26. PMID: 31356958; PMCID: PMC7315644.

**2021**

**Kimberly Claey**s, 2017 SIDP Accelerate Diagnostics Research Award recipient, performed an observational research study to compare two rapid diagnostic test platforms on potential desirability of antimicrobial therapy decisions.

Claeys KC, Hopkins TL, Schlaffer K, Hitchcock S, Jiang Y, Evans S, Johnson JK, Leekha S. Comparing the clinical utility of rapid diagnostics for the treatment of Bloodstream Infections using Desirability of Outcome Ranking approach for the Management of Antibiotic Therapy (DOOR-MAT). *Antimicrob Agents Chemother.* 2021 Jul 6: AAC0044121. doi: 10.1128/AAC.00441-21. Epub ahead of print. PMID: 342285



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