

## Department of Pharmaceutical Chemistry

### Supervisors

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### Research Areas:

Drug design and synthesis  
Drug metabolism  
Cancer and inflammation  
Apoptosis  
Antibacterials, resistant strains, quorum sensing inhibitors  
Antivirals (HIV, HCV, DENV, influenza etc.)  
Enzyme inhibitors as drug candidates  
- HIV-1 RT, HCV NS5B, COX-I/II, LOX, hCA, InhA, DNA gyrase, MetAP, tyrosine kinases  
Organic synthesis, isolation and characterization of  
- 1,2,4-Triazoles; 1,3,4-oxadiazoles; 1,3,4-thiadiazoles; 1,3,-thiazolidine-4-ones; 1,3-thiazoles; pyrazoles  
- Ureas, thioureas, thioethers, amides, hydrazones, thioethers, oximes  
HPLC method development and validation for APIs in pharmaceutical dosage forms and biological fluids.

### Recent Publications (2013- 2016)

- Kulabaş N, Tatar E, Bingöl Özakpınar Ö, Özsvacı D, Pannecouque C, De Clercq E, Küçükgülzel İ. Synthesis and antiproliferative evaluation of novel 2-(4H-1,2,4-triazole-3-ylthio)acetamide derivatives as inducers of apoptosis in cancer cells. *Eur J Med Chem.* 2016;121:58-70. doi:10.1016/j.ejmech. PMID: 27214512.
- Tatar E, Karakuş S, Küçükgülzel ŞG, Öktem Okullu S, Ünübol N, Kocagöz T, De Clercq E, Andrei G, Snoeck R, Pannecouque C, Kalaycı S, Şahin F, Sriram D, Yogeewari P, Küçükgülzel İ. Design, Synthesis, and Molecular Docking Studies of a Conjugated Thiadiazole-Thiourea Scaffold as Antituberculosis Agents. *Biol Pharm Bull.* 2016;39(4):502-15. doi:10.1248/bpb.b15-00698. PMID: 27040623.
- Sarıözkan S, Türk G, Çıkla-Süzgün P, Güvenç M, Yüce A, Yay AH, Cantürk F, Küçükgülzel ŞG. Effect of etodolac hydrazone, a new compound synthesised from etodolac, on spermatozoon quality, testicular lipid peroxidation, apoptosis and spermatozoon DNA integrity. *Andrologia.* 2016;48(2):177-88. doi: 10.1111/and.12429. PMID: 25929857.
- Küçükgülzel ŞG, Coşkun GP. Macromolecular Drug Targets in Cancer Treatment and Thiosemicarbazides as Anticancer Agents. *Anticancer Agents Med Chem.*

2016;16(10):1288-300. PMID: 26899188.

- Manvar D, Küçükgülzel İ, Erensoy G, Tatar E, Deryabaşoğulları G, Reddy H, Talele TT, Cevik O, Kaushik-Basu N. Discovery of conjugated thiazolidinone-thiadiazole scaffold as anti-dengue virus polymerase inhibitors. *Biochem Biophys Res Commun.* 2016;469(3):743-7. doi:10.1016/j.bbrc. PMID: 26697747.
- Şenkardeş S, Kaushik-Basu N, Durmaz İ, Manvar D, Basu A, Atalay R, Küçükgülzel ŞG. Synthesis of novel diflunisal hydrazide-hydrazones as anti-hepatitis C virus agents and hepatocellular carcinoma inhibitors. *Eur J Med Chem.* 2016;108:301-8. doi: 10.1016/j.ejmech. PMID: 26695731.
- Şenkardeş S, Özakpınar ÖB, Özsavcı D, Şener A, Çevik Ö, Küçükgülzel ŞG. Synthesis of Diflunisal Thiazolidinones as Anticancer Agents. *Anticancer Agents Med Chem.* 2016;16(10):1266-74. PMID: 26320814.
- Küçükgülzel ŞG, Koç D, Çıkla-Süzcün P, Özsavcı D, Bingöl-Özakpınar Ö, Mega-Tiber P, Orun O, Erzincan P, Sağ-Erdem S, Şahin F. Synthesis of Tolmetin Hydrazide-Hydrazones and Discovery of a Potent Apoptosis Inducer in Colon Cancer Cells. *Arch Pharm (Weinheim).* 2015;348(10): 730-42. doi:10.1002/ardp.201500178. PMID: 26287512.
- Yılmaz Ö, Özbaş Turan S, Akbuğa J, Tiber PM, Orun O, Supuran CT, Küçükgülzel ŞG. Synthesis of pro-apoptotic indapamide derivatives as anticancer agents. *J Enzyme Inhib Med Chem.* 2015;30(6):967-80. doi:10.3109/14756366.2014.1001756. PMID: 25683085.
- Çıkla-Süzcün P, Kaushik-Basu N, Basu A, Arora P, Talele TT, Durmaz I, Çetin-Atalay R, Küçükgülzel ŞG. Anti-cancer and anti-hepatitis C virus NS5B polymerase activity of etodolac 1,2,4-triazoles. *J Enzyme Inhib Med Chem.* 2015;30(5):778-85. doi:10.3109/14756366.2014.971780. PMID: 25676325.
- Küçükgülzel ŞG, Çıkla-Süzcün P. Recent advances bioactive 1,2,4-triazole-3-thiones. *Eur J Med Chem.* 2015; 97: 830-70. doi:10.1016/j.ejmech.2014.11.033. Review. PMID: 25563511.
- Küçükgülzel ŞG, Şenkardeş S. Recent advances in bioactive pyrazoles. *Eur J Med Chem.* 2015; 97: 786-815. doi:10.1016/j.ejmech.2014.11.059. Review. PMID: 25555743.
- Çakir G, Küçükgülzel İ, Guhamazumder R, Tatar E, Manvar D, Basu A, Patel BA, Zia J, Talele TT, Kaushik-Basu N. Novel 4-thiazolidinones as non-nucleoside inhibitors of hepatitis C virus NS5B RNA-dependent RNA polymerase. *Arch Pharm (Weinheim).* 2015;348(1):10-22. doi:10.1002/ardp.201400247. PMID: 25449674.
- Küçükgülzel I, Satılmış G, Gurukumar KR, Basu A, Tatar E, Nichols DB, Talele TT, Kaushik-Basu N. 2-Heteroarylimino-5-arylidene-4-thiazolidinones as a new class of

non-nucleoside inhibitors of HCV NS5B polymerase. *Eur J Med Chem.* 2013;69: 931-41. doi:10.1016/j.ejmech.2013.08.043. PMID: 24161679; PMCID: PMC4004375.

- Küçükgülzel ŞG, Coşkun İ, Aydın S, Aktay G, Gürsoy Ş, Çevik Ö, Özakpınar ÖB, Özsavcı D, Şener A, Kaushik-Basu N, Basu A, Talele TT. Synthesis and characterization of celecoxib derivatives as possible anti-inflammatory, analgesic, antioxidant, anticancer and anti-HCV agents. *Molecules.* 2013;18(3):3595-614. doi: 10.3390/molecules18033595. PMID: 23519201.
- Tatar E, Küçükgülzel I, Daelemans D, Talele TT, Kaushik-Basu N, De Clercq E, Pannecouque C. Some hydrazones of 2-arylamino-3-methylbutanohydrazide: synthesis, molecular modeling studies, and identification as stereoselective inhibitors of HIV-1. *Arch Pharm (Weinheim).* 2013;346(2):140-53. doi: 10.1002/ardp.201200311. PMID: 23280502.
- Tabanca N, Ali A, Bernier UR, Khan IA, Kocyigit-Kaymakcioglu B, Oruç-Emre EE, Unsalan S, Rollas S. Biting deterrence and insecticidal activity of hydrazide-hydrazones and their corresponding 3-acetyl-2,5-disubstituted-2,3-dihydro-1,3,4-oxadiazoles against *Aedes aegypti*. *Pest Manag Sci.* 2013;69(6):703-8. doi: 10.1002/ps.3424. PMID: 23117879.