

Student Scientific Research Group
“Electrophoresis in Drug Research and Analysis (ECDrug)”
Academic year 2017/2018

Members:

Gabriel Hancu, PhD, associate professor (coordinator)

Hajnal Kelemen, PhD, associate professor

Aura Rusu, PhD, associate professor

Székely Szentmiklósi Blanka, PhD, assistant professor

Lajos Attila Papp, PhD student

Melania Cârțu-Dobrin, PhD student

Monica Budău, PhD student



Students working in the research group (2017-2018):

1. Cosma Liliana (V)
2. Dumitru Diana (V)
3. Oilă Nicoleta (V)
4. Radu Adina (V)
5. Dolea Laura (IV)
6. Drăguț Claudiu (IV)
7. Hegyesi Andrea (IV)
8. Mailat Cristiana (IV)
9. Mezősi Adrien (IV)
10. Sarkany Anita (IV)
11. Todea Ștefania (IV)

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Research topics:

1. Development of capillary electrophoresis methods for the determination of pharmaceutical substances from pharmaceutical preparations

- 1.1. Development of capillary electrophoresis methods for the simultaneous determination of pharmaceutical substances with similar structural and physico-chemical characteristics
- 1.2. Development of capillary electrophoresis methods for the simultaneous determination of pharmaceutical substances from fixed dose combinations

2. Applications of capillary electrophoresis in the analysis of chiral pharmaceutical substances

- 2.1. Cyclodextrins as chiral selectors in the enantioseparation of pharmaceutical substances by capillary electrophoresis
- 2.2. Neutral cyclodextrins vs. ionized cyclodextrins in the chiral separation of pharmaceutical substances by capillary electrophoresis
- 2.3. Chiral analysis of pharmaceuticals by capillary electrophoresis using antibiotics as chiral selectors
- 2.4. Method development and optimization for the separation and determination of enantiomers in pharmaceutical preparations by capillary electrophoresis
- 2.5.. High performance liquid chromatography vs. Capillary electrophoresis in modern chiral analysis

3.Applications of capillary electrophoresis in the analysis of biological samples

- 3.1.Development of capillary electrophoresis methods for determination of pharmaceutical substances from biological samples (urine, plasma).

Relevant techniques:

Capillary electrophoresis (CE)
High performance liquid chromatography (HPLC)

Relevant *in extenso* ISI and BDI articles of the research team (students are marked with *):

ISI articles:

1. Budău M.* Hancu G. Szabó ZI. Kelemen H. Rusu A. Muntean DL. Cârje AG. *Captisol® as chiral selector in capillary electrophoresis of non-acidic drugs*. Journal of the Chilean Chemical Society, 2017, 62(3):3566-3571, FI: 0,422 (2016).

2. Cârțu-Dobrin M.* Budău M. Hancu G. Gagyi L. Rusu A. Kelemen H. *Enantioselective analysis of fluoxetine in pharmaceutical formulations by capillary zone electrophoresis*. Saudi Pharmaceutical Journal, 2017, 25, 397-403, FI: 2,302 (2016).
3. Stăcescu Ș.* Hancu G. Gagyi L. Soare RM. Kelemen H. *Simultaneous determination of hydrochlorothiazide and telmisartan from pharmaceutical preparations using capillary electrophoresis*. Studia Chimica UBB, ISSN 1224-7154 (print), ISSN 2065-9520 (online), 2017, LXII, 2, 189-198, doi: 10.24193/subbchem.2017.2.14, FI: 0,244 (2016).
4. Mircia E. Hancu G. Nițu O.* Kelemen H. Cârțu-Dobrin M.* Gâz ȘA. Balaci T. *Simultaneous determination of fibrates by micellar electrokinetic capillary chromatography*. Farmacia, 2017, 65(1), 109-113, ISSN 0014-8237 (print), ISSN 2065-0019 (on-line), FI: 1,348 (2016).
5. Hancu G. Neacșu A.* Papp LA.* Ciurba A. *Simultaneous determination of amoxicillin and clavulanic acid in pharmaceutical preparations by capillary electrophoresis*. Brazilian Journal of Pharmaceutical Sciences, 2016, 52(2): 281-286, FI: 0,474.
6. Hancu G. Hilochie A.* Vlad R.A.* Cârje A. Tero-Vescan A., *Enantiomeric separation of sibutramine by capillary zone electrophoresis*. Journal of the Brazilian Chemical Society, 2016, 26(7): 1116-1120, ISSN 1678-4790 (online), ISSN 0103-505 (print), FI: 1,198.
7. Szabó ZI.* Tóth C.* Hancu G. Muntean DL., *Simultaneous chiral separation of four H1-antihistamines by capillary zone electrophoresis using a dual cyclodextrin system*, Chromatographia, 2015, 78(21): 1377-1384, doi: 10.1007/s10337-015-2967-y, ISSN: 0009-5893 (print), 1612-1112 (online), FI: 1,332.
8. Hancu G. Papp L.* Rusu A., *Chiral separation of the enantiomers of omeprazole and pantoprazole by capillary electrophoresis*. Chromatographia, 2015, 78: 279-284, FI: 1,332.
9. Hancu G. Cârje A. Iuga I.* Fülöp I. Szabó ZI.* *Cyclodextrine screening for the chiral separation of carvedilol by capillary electrophoresis*. Iranian Journal of Pharmaceutical Research, 2015, 14(2): 425-433, FI: 1,352.
10. Hancu G. Sasebeși A.* Rusu A. Kelemen H. Ciurba A. *Study of the electrophoretic behavior of cephalosporins by capillary zone electrophoresis*. Advanced Pharmaceutical Bulletin, 2015, 5(2): 223-229.
11. Hancu G. Budău M.* Kántor L.K.* Cârje A. *Cyclodextrine screening for the chiral separation of amlodipine enantiomers by capillary electrophoresis*. Advanced Pharmaceutical Bulletin, 2015, 5(1): 35-40.
12. Hancu G. Sămărghișan C.* Rusu A. Mircia E. *Sotalol chiral separation by capillary electrophoresis*. Journal of Chilean Chemical Society 2014, 59(3): 2559-2562, FI: 0.469.
13. Ciurba A. Hancu G. Cojocea L.* Sipos E. Todoran N. *Development of new formulation and its evaluation by capillary electrophoresis of tablets containing tramadol hydrochloride and paracetamol*. Pharmaceutical Development and Technology 2014, 19(7): 833-838, FI: 1.335.

14. Hancu G. Rusu A. Simon B. Boia G.* Gyéresi Á. *Simultaneous separation of ciprofloxacin, norfloxacin and ofloxacin by micellar electrokinetic chromatography*. Journal of Brazilian Chemical Society 2012, 23(10): 1889-1894, FI: 1.283.

BDI articles:

1. Rusu A. Sbanca M.A.* Todoran N. Vari CE. *Letrozole Determination by Capillary Zone Electrophoresis and UV Spectrophotometry Methods*, Acta Medica Marisiensis, 2017, 63(2): 80-86.
2. Mircia E. Hancu G. Rusu A. Cazacu A.* Balaci T. Soare R. *Determination of HMG-CoA reductase inhibitors by micellar electrokinetic chromatography*, Acta Medica Marisiensis, 2016, 62(2): 187-191.
3. Modroiu A.* Hancu G. Vlad RA. Stăcescu Ș*. Soare R. Kelemen H. *Simultaneous determination of amlodipine and telmisartan from pharmaceutical products by capillary electrophoresis*, Current Issues in Pharmacy and Medical Sciences. 2016. 29(1): 42-45.
4. Gorea D.* Hancu G. Rusu A. Cârje A. Barabás E. *Indicatori de evaluare a calitatii apelor de suprafata si solurilor in proximitatea fostei exploatare de sulf din Muntii Calimani*. Forum Geografic, 2014, XIII(2): 212-218.
5. Hancu G. Budău M.* Papp L.A.* Rusu A. Mircia E. *Chiral separation of cetirizine enantiomers by cyclodextrin mediated capillary electrophoresis*. Indonesian Journal of Pharmacy 2014, 25(4): 223-229, DOI: 10.14499/indonesianjpharm25iss4pp223.
6. Tero Vescan A. Hancu G. Oroian M.* Cârje A. *Chiral separation of indapamide enantiomers by capillary electrophoresis*. Advanced Pharmaceutical Bulletin 2014, 4(3): 267-272.
7. Hancu G. Câmpian C.* Rusu A. Mircia E. Kelemen H. *Simultaneous determination of loratadine, desloratadine and cetirizine by capillary zone electrophoresis*. Advanced Pharmaceutical Bulletin 2014, 4(2): 161-165.

Papers presented at scientific meetings by students member of the scientific research group (highlighted name):



1. **Cârcu-Dobrin M.** Budău M. Hancu G. Kelemen H. Rusu A. Separarea chirală a fluoxetinei prin electroforeză capilară utilizând ciclodextrine ca și selectori chirali (Chiral discrimination of fluoxetine enantiomers by capillary electrophoresis using cyclodextrins as chiral selectors), Congresul Național de Farmacie București, 28 septembrie – 1 octombrie 2016, volum de rezumate, ID 45
2. **Stăcescu Ș.** Hancu G. Soare R. Rusu A. Szekey-Szentmiklosi B. Gagy L. Determinarea simultană a hidroclortiazidei și a telmisartanului din forme farmaceutice prin electroforeză capilară

(Simultaneous determination of hydrochlorthiazide and telmisartan from pharmaceutical products by capillary electrophoresis), Congresul Național de Farmacie București, 28 septembrie – 1 octombrie 2016, volum de rezumate, ID 51.

3. Budău M. **Uilăcan A.** Papp LA. Hancu G. Kelemen H. Muntean DL. Separarea chirală a venlafaxinei prin electroforeză capilară utilizând un sistem dual de ciclodextrine (Venlafaxine chiral separation by capillary electrophoresis using a dual cyclodextrine system), Congresul Național de Farmacie București, 28 septembrie – 1 octombrie 2016, volum de rezumate, ID 52.



4. **Uilăcan A.** Moldovan A. Hancu G. Budău M. Venlafaxine chiral separation by capillary electrophoresis using a dual cyclodextrin system, International Congress for Students, Young Physicians and Pharmacists, Marisiensis, Tîrgu Mureș, 30 martie – 3 aprilie, 2016, Acta Medica Marisiensis, 62(4): 86.

5. **Stăcescu Ș.** Hancu G. Simultaneous determination of telmisartan and hydrochlorothiazide by capillary electrophoresis, International Congress for Students, Young Physicians and Pharmacists, Marisiensis, Tîrgu Mureș, 30 martie – 3 aprilie, 2016, Acta Medica Marisiensis, 62(4): 87.

6. **Cârcu-Dobrin M.** Hancu G. Budău M. Chiral determination of cetirizine enantiomers from pharmaceutical products by capillary electrophoresis, International Congress for Students, Young Physicians and Pharmacists, Marisiensis, Tîrgu Mureș, 30 martie – 3 aprilie, 2016, Acta Medica Marisiensis, 62(4): 88.

7. **Iriminescu DN.** Hancu G. Simultaneous equation and first-derivative UV spectrophotometric methods for the simultaneous determination of rifampicin and isoniazid, International Congress for Students, Young Physicians and Pharmacists, Marisiensis, Tîrgu Mureș, 30 martie – 3 aprilie, 2016, Acta Medica Marisiensis, 62(4): 93

8. **Cârcu-Dobrin M.** Budău M. Rusu A. Mircia E. Hancu G. Chiral discrimination of fluoxetine enantiomers by capillary electrophoresis using cyclodextrins as chiral selectors, Sesiunea Științifică a Cadrelor Didactice, 11 Decembrie, 2015, Acta Medica Marisiensis, 61(8): 52.

9. **Modroiu A.** Székely Szentmiklósi B. Kelemen H. Soare R. Hancu G. Determination of amlodipine and telmisartan from fixed dose combinations by capillary electrophoresis, Sesiunea Științifică a Cadrelor Didactice, 11 Decembrie, 2015, Acta Medica Marisiensis, 61(8): 74.



10. Hancu G. **Cârcu-Dobrin M. Budău M.** Kelemen H. Rusu A. Szabó ZI. Gagy L. Enantioseparation of fluoxetine in pharmaceutical formulations by capillary electrophoresis, The 15th International Symposium and Summer School on Bioanalysis, Țirgu Mureș, 13-18 Julie 2015, Acta Medica Marisiensis, 2015, 61(5): 28.
11. Kelemen H. **Papp L.A.** Hancu G. Rusu A. Cârje AG. Szentmiklósi-Székely B. Simultaneous determination of amoxicillin and clavulanic acid: UV-spectrometry versus capillary electrophoresis, The 15th International Symposium and Summer School on Bioanalysis, Țirgu Mureș, 13-18 Julie 2015, Acta Medica Marisiensis, 2015, 61(5): 31.
12. Mircia E. **Soare R.** Hancu G. Gyéresi Á. Simultaneous determination of statins by capillary electrophoresis, The 15th International Symposium and Summer School on Bioanalysis, Țirgu Mureș, 13-18 Julie 2015, Acta Medica Marisiensis, 2015, 61(5): 34.
13. Rusu A. **Popescu G.C.** Imre S. Ion V. Vancea S. Hancu G. Kelemen H. Uivaroși V. Preliminary methods of obtaining silver complexes with representatives of the fluoroquinolone class, The 15th International Symposium and Summer School on Bioanalysis, Țirgu Mureș, 13-18 Julie 2015, Acta Medica Marisiensis, 2015, 61(5): 37.



14. **Butucea A.** Simion A. Vlad R.A. Hancu G. Study regarding the recreational use of benzodiazepines, The 19th International Scientific Congress for Students, Young Physicians and Pharmacists, Marisiensis, Țirgu Mureș, 23-25 Aprilie, 2015, Acta Medica Marisiensis, 2015, 61(2): 85.
15. **Stăcescu S.** Călugăreanu I.G. Irimia-Constantin M.R. Hancu G. Phosphodiesterase-5 inhibitors: overview, present and perspectives, The 19th International Scientific Congress for Students, Young Physicians and Pharmacists, Marisiensis, Țirgu Mureș, 23-25 Aprilie, 2015, Acta Medica Marisiensis, 2015, 61(2): 87.
16. **Cârcu-Dobrin M.** Rusu A. Hancu G. Chiral separation of fluoxetine by capillary electrophoresis using cyclodextrins as chiral selectors, The 19th International Scientific Congress for Students, Young Physicians and Pharmacists, Marisiensis, Țirgu Mureș, 23-25 Aprilie, 2015, Acta Medica Marisiensis, 2015, 61(2): 88.
17. **Hilochie A.E.,** Hancu G. Tero-Vescan A. Cyclodextrins screening for the chiral separation of sibutramine by capillary electrophoresis, The 19th International Scientific Congress for Students, Young Physicians and Pharmacists, Marisiensis, Țirgu Mureș, 23-25 Aprilie, 2015, Acta Medica Marisiensis, 2015, 61(2): 88.



18. Hancu G. **Papp LA.** Rusu A. Kelemen H. Chiral separation of omeprazole enantiomers by capillary electrophoresis. University Scientific Session, 8-12 Decembrie, 2014, Acta Medica Marisiensis, Abstract volume, 117.