Oqsillar va peptidlar kimyosi laboratoriyasi

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Oqsillar va peptidlar kimyosi laboratoriyasi 1973 yilda zoofitotoksinlar laboratoriyasi negizida tashkil topgan bo‘lib, O‘zRFA Bioorganik kimyo bo‘limining bo‘linmalaridan biri hisoblangan. Laboratoriya faoliyati davomida tabiiy birikmalar, toksinlar, fermentlar va boshqa biologik faol komponentlarning tuzilishi va funktsiyasi o‘rganilgan. O‘rta Osiyo hayvonlari zaharidan birinchi bo‘lib toksik ta’sirga ega 50 dan ortiq fiziologik faol oqsillar va peptidlar ajratib olingan, ulardan 15 tasining kimyoviy birlamchi tuzilishi aniqlangan. O‘rgimchak *Lactrodectus*zaharidan oqsil tabiatga ega bo‘lgan murakkab to‘rtlamchi tuzilishli, molekulyar massasi 75000 Da ga teng to‘rtta subbirlikdan tashkil topgan neyrotoksin ajratib olingan (Toshmuxamedov M.S., Qosimov A.A., Odilbekov M.T., Salixov Sh.I.,). Turli bo‘g‘imoyoqlilar zaharidan ajratilgan yuqori spetsifiklikka ega bo‘lgan toksinlarni tadqiq qilish ularning ta’sir mexanizmini o‘rganish va ulardan neyrofiziologik tadqiqotlar uchun “asbob” sifatida foydalanish imkonini berdi (Salixov Sh.I., Qosimov A.A.). O‘rganilgan qator yuqori spetsifik neyrotoksinlardan foydalanish biologik membrananing strukturaviy va molekulyar xususiyatlari bilan bog‘liq bo‘lgan tirik hujayrada sodir bo‘ladigan muhim hayotiy jarayonlarni anglab yetishga olib keladi. Tadqiqotlarning amaliy yakuni o‘laroq ajratib olingan neyrotoksinlardan antitela sifatida foydalangan holda kobra, chayon va qoraqurt zaharlariga qarshi antizardob yaratishdan iborat edi (Salixov Sh.I., Qosimov A.A., Inog‘amov O‘.Q.).

Bir qator kichik molekulali toksinlarning turli patologik holatlarda: surunkali buyrak yetishmovchiligi, travmatologiya, turli virusli kasalliklarda tuzilishi o‘rganildi. Gemodializ jarayonlarini dasturlashni ta’minlashga imkon beruvchi kichik molekulali toksinlar kontsentratsiyasini miqdoriy aniqlashning ekspress usuli ishlab chiqildi (Muxamadieva Sh.G., Kadrova A.F., Sultanova E.M.). sorbentlar bilan toksin kon’yugatlari asosida immunosorbentlar olindi (Qosimov A.A., Salixov Sh.I.). O‘zbekiston Respublikasi tibbiyot hodimlari bilan hamkorlikda ishlar olib borildi va ular asosida tibbiyot soxasida nomzodlik va doktorlik dissertatsiyalari himoya qilindi.

1984 yilda laboratoriya faoliyati o‘simlik va hayvonlar organizmidan ajratib olingan oqsillar va peptidlarni tadqiq etishga, shuningdek, g‘o‘zaning o‘sish va rivojlanish jarayonlarida kechadigan biokimyoviy jarayonlarni o‘rganishga yo‘naltirildi. G‘o‘zaning gormonga bog‘liq oqsillarining tuzilishi va funktsiyasi uning o‘sish va rivojlanish jarayonida o‘rganildi. G‘o‘zadan fitogormon retseptorlari ajratildi, fizik-kimyoviy xossalari o‘rganildi va ularning g‘o‘za barglarini to‘kilishidagi regulyatorlik roli isbotlandi. G‘o‘zada defoliatsiya paytida sodir bo‘ladigan jarayonlarning molekulyar mexanizmi tadqiq qilindi. Ushbu tadqiqotlar asosida defolirlovchi va o‘sishni stimullovchi faollikka ega bo‘lgan birikmalar skriningi kriteriyalari ishlab chiqildi. (Veshkurova O.N., Salixov Sh.I.).

Laboratoriyada fan doktori ilmiy darajasini olish uchun 7 ta dissertatsiya himoya qilindi; Dolimbek Bexzod Ziyotbek (Texas Universiteti professori), Abulimiti Yili (XXR FA Shinjon fizika va kimyo texnika instituti direktor o‘rinbosari) shular jumlasidandir.

Laboratoriya tashkil etilgandan beri unga akademik, b.f.d. Salixov Sh.I. (1973 yildan 2017 yilgacha.) va k.f.d. Ощepkova Yu.I (2018 yildan) rahbarlik qilib kelmoqdalar.

2018 yilda Institutni qayta tashkillashtirish natijasida Leontev V.B. (1973 yildan 1999 yilgacha), prof. Sodiqov A.A. (1999 yildan 2005 yilgacha) va k.f.n. Sagdiev N.J. (2005 yildan 2017 yilgacha) rahbarlik qilgan bioregulyatorlar laboratoriyasi laboratoriya tarkibiga kiritildi. Professor Leontev V.B. rahbarligi ostida rekonstruktsiyalangan nukleoproteid komplekslari olindi, yadroviy oqsil gistonlar, giston bo‘lmagan oqsillar, HMG – *in vitro* va nativ xromatinda transkriptsiyani regulyatsiyalovchi oqsillar roli o‘rganildi. Yadro oqsillari va ular genomining funktsional jihatdan ahamiyatli hududlari kimyoviy tuzilishini o‘zgarishida allosteriya va kooperativ tabiatning konformatsion o‘zgarishlarining muhim roli aniqlandi. (Mangutova

Yu.S., Faynboym A.M., Leontev V.B.). Hujayra yadrosining oqsil biosintezidagi roli,. (Saitmuratova O.X., Leontev V.B.), shuningdek, yadro ichidagi biosintez mexanizmi va asab to‘qimalari yadroviy va neytral oqsillarining funktsional rolini aniqlashga bag‘ishlangan qator tadqiqotlar olib borildi. Vaznsizlik sharoitida poliakrilamid geli sintezi bo‘yicha tajribalar taklif etildi va amalga oshirildi. Tarmoqlangan tuzilishning xossalari tortishish kuchiga bog‘liqligi aniqlandi (Sodiqov A.A., Leontev V.B., Grechko G.M.).
Laboratoriyada yuqori texnologiyalardan biri – monoklonal antitelalar olish bo‘yicha gibrid biotexnologiya o‘rnatildi (Xashimova Z.S., Mangutova Yu.S., Suslo M.E., Leontev V.B.). KML (sichqon terisi o‘smasi), Akat (sichqon ingichka ichagi o‘smasi) va sarkoma S- 180 kabi ko‘chirib o‘tkaziladigan rak hujayralari kulturalari olindi; ushbu hujayra tizimlari asosida biologik faol moddalar, shu jumladan, o‘smaga qarshi vositalar skriningi uchun test-tizim yaratildi. (Kuznetsova N.N., Mardanova Z.I., Leontev V.B., Xashimova Z.S., Sodiqov A.A.), shuningdek, KML hujayra liniyasidan foydalangan holda metastazlash modeli olindi.
So‘nggi yillarda Oqsillar va Peptidlar Kimyosi laboratoriyasida o‘simlik va hayvonlar bioregulyatorlarini struktur-funktsional xarakterlash bo‘yicha tadqiqotlar olib borildi va ular asosida tibbiyot va qishloq xo‘jaligi sohasida muvaffaqqiyatli qo‘llanilib kelinayotgan bir qator preparatlar yaratildi.

Laboratoriyaning asosiy ilmiy yo‘nalishlari:

o‘simlik va hayvonlar antimikrob peptidlari va bioregulyatorlarining struktur-funktsional xarakteristikasi va ta’sir mexanizmi tadqiqi, oqsil-peptidli bioregulyatorlar olish texnologiyasini ishlab chiqish va ular asosida tibbiyot va qishloq xo‘jaligi soxalari uchun preparatlar yaratish, barqarorlik namoyon qiluvchi, prolongirlangan ta’sirga ega, biomavjudligining samaradorligi orttirilgan makromolekulyar terapevtik tizimlarni konstruktsiyalash.



Ilmiy yo‘nalish:

- Markaziy Osiyo o‘simlik va hayvonlarining oqsil-peptid tabiatli fiziologik faol moddalarining tadqiqi.

- o‘simlik va hayvonlar oqsil-peptidli bioregulyatorlari asosida yangi dorivor vositalar yaratish va ishlab chiqarish.
- barqarorlik namoyon qiluvchi, prolongirlangan ta’sirga ega, biomavjudligining samaradorligi orttirilgan makromolekulyar terapevtik tizimlarni konstruktsiyalash.

Eng muhim natijalar:

- antimikrob peptidlar va PR-oqsillarning o‘simlik patogen zamburug‘lariga chidamliligi o‘rganildi, bir qator tsisteinga boy peptidlar individual tarzda ajratib olindi, ularning qisman N-oxiri aminokislota ketma-ketligi aniqlandi;
- gossipol va qator terpenoidlarning g‘o‘za zararkunanda hasharotlari *Heliothis* oilasi uchun toksik ta’siri molekulyar mexanizmi tadqiq qilindi;
- dorivor preparatlarning bioxavfsizligi va bioekvivalentliligini farmakokinetik baholash bo‘yicha sinov markazi tashkil etildi;
- Ns-D2 defenzini va *BucalT* insektotoksinining rekombinat shakllari olindi;
- sut emizuvchilar organlari regulyator peptidlari asosida yallig‘lanish kasalliklarini davolash uchun “Aflan”, tromblar hosil bo‘lishini oldini olish va davolash uchun “Kardin” dorivor preparatlari yaratildi;
- mexanik yaralar va termik kuyishlardan keyingi yiringli-septik asoratlarni davolash uchun “Sedanil” farmatsevtik kompozitsiyasi yaratildi;
- onkologik kasalliklar sut bezi o‘smasi, melanoma, to‘g‘ri ichak va endometriy o‘smalarini kompleks davolash uchun tavsiya etilgan “Biokor” –immunomodulyator preparati yaratildi;
- osteoporoz, yurak qon-tomir kasalliklari, sut bezi, endometriy, tuxumdon o‘smasi kasalliklari va menopauza simptomlarini davolash uchun “Soyaflan” –immunoreabilitatsiya tipidagi preparat yaratildi;
- o‘simlik yog‘laridan fermentativ usulda biodizel olishning samarali sxemasi ishlab chiqildi;
- tabiiy ob’ektlardan fiziologik faol moddalarni ajratish uchun mahalliy xom-ashyolar asosida ion-almashinuvchi, gidrofob va affin sorbentlar sintez qilish usullari ishlab chiqildi;
- sichqonlar ingichka ichagi o‘smasidan yangi ko‘chirib o‘tkaziladigan xujayra kulturasi ajratib olindi.

Natijalarning amaliy ahamiyati:

- O‘zbekiston Respublikasi farmsanoat korxonalarida yaratilayotgan original va generik preparatlarning bioekvivalentligi bo‘yicha farmakokinetik tadqiqotlar olib borilmoqda.
- Yuqori samarali immunostimullovchi preparat “Timoptin” in’ektsiya uchun liofillangan kukun ishlab chiqarilmoqda. №5 flakonlarda 100 mkg dan (Institutda 2000 yildan beri ishlab chiqarilmoqda va O‘zbekiston Respublikasi dorixonalariga yetkazilmoqda);
- Tayanch-harakatlanish apparati yallig‘lanish kasalliklarini davolash uchun “Apikapsalvin” preparati tibbiyot amaliyotida qo‘llanilmoqda;
- “ Eritim 0,001% eritmasi” kamqonlikning yengil, o‘rta va og‘ir darajalarini davolash uchun eritropoez stimulyatori sifatida tibbiyot amaliyotida qo‘llanilmoqda (Institutda 2016 yildan beri ishlab chiqarilmoqda va O‘zbekiston Respublikasi dorixonalariga yetkazilmoqda).

Kelgusi rejalar:

- Aflan preparati bo‘yicha klinik sinovlar o‘tkazish va O‘zR FA Bioorganik kimyo Instituti bazasida ishlab chiqarishni tashkil etish.
- Kardin preparati bo‘yicha klinik sinovlar o‘tkazish va O‘zR FA Bioorganik kimyo Instituti bazasida

ishlab chiqarishni tashkil etish.
- Sedanil preparati bo‘yicha klinik sinovlar o‘tkazish va ishlab chiqarishni tashkil etish.
- Biokor preparati bo‘yicha klinik sinovlar o‘tkazish va ishlab chiqarishni tashkil etish.

- barqarorlik namoyon qiluvchi, prolongirlangan ta’sirga ega, biomavjudligining samaradorligi orttirilgan yangi makromolekulyar terapevtik tizimlarni ishlab chiqish.
- yangi ko‘chirib o‘tkaziladigan xujayra kulturasi liniyalarini olish va ular asosida biologik faol moddalarni keng ko‘lamda skrining qilish uchun test tizim yaratish va ularning ta’sir mexanizmini o‘rganish

Ilmiy aloqalar:

RFA M.M.Shemyakin va Yu.A.Ovchinnikov nomidagi Bioorganik kimyo instituti;
RFA elementorganik birikmalar instituti; College Station, USA G‘o‘za patologiyasi bo‘limi; ARS Eyms Tuproq xo‘jaligi milliy laboratoriyasi, Ayova, AQSh;
XXR FA Shinjon fizika va kimyo texnika instituti;
Qishloq xo‘jaligi tadqiqotlari milliy instituti, Nant, Frantsiya. Stuttgart University,
Institute of Technical Biochemistry National Technical University of Athens, School of chemical engineering, Athens, Greece;
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