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LIGAMED

A biotechnology company that focuses on the development, manufacturing and marketing of innovative and functional biomaterials.

Ligamed Medical Co. Ltd. is one the leading company in the world that can produce osteoinductive and osteoconductive synthetic bone graft materials, barrier membrane, bone cement and cartilage graft. Ligamed R&D activites take place at Ege University Technology Development Centre under ISO-7 (Class 10000). Since 2016 production to ISO-5, ISO 6 and ISO-7 (Class 100,1000,10,000) conditions takes place in Manisa.

In addition to expert employees, high technology and strongcapital, Ligamed Medical customer service exceeds Internationally recognised quality and management standards.



VISION-MISSION

Our Vision;

Our aims are to become a globally competitive and respected biomaterials company that draws attention to developed strategic innovations and to bring the name and power of our country in the field of biomaterials manufacturing to the top.

Our Mission;

To have the widest and most innovative biomaterials range in the field of orthopedic, spine, trauma, and dental surgeries with the maximum investment power to R&D studies.



R&D-Oriented Production



Production

Ligamed's modern production facility is electronically controlled. Multiple production parameters are observed in real time 24/7 according to ISO7 standard. The production areas ar monitored according to ISO14644 Class 10.000 and Fed.Std.209 D, ISO5. ISO 14644 is applied to the clean rooms and packaging areas to Fed.Std.209D.

All raw materials and equipment used in production processes are supplied from European and American companies with the highest technological standards.

TSE approved TS EN ISO 13485 Quality Management System

Our products bear the CE mark as Class III Medical Device, in which the highest level of safety standards are applied to the production conditions. Product quality control tests are carried out in reputable universities and test organizations in Turkey and abroad.

Quality

Quality control is carried out in accordance with production instructions using measurement devices unique to each specific medical device.

BIOMATERIAL INNOVATION REPLACED BY NEW BONE

- Innovative Flexible Bone Graft
- Connected high pore structure, cross-section of bone grafts for different geometries and sizes
- Bone graft in injectable form that does not require mixing



LIGAMED PRODUCT TECHNOLOGY

Ligamed products are designed to repair bone defects caused by surgery or traumatic injury, to increase bone formation or support the formation of new bone tissue in non-load bearing sites. Many of our biomaterials can be mixed with bone marrow, blood products, pharmaceuticals such as antibiotics or other bone grafts materials.



CERTIFICATES



•ISO 9001

•CE Certificates for each product groups



PRODUCTS

SILICATE ADDITIVE GRANULE, STICK, BLOCK & WEDGE

Osteoconductive and Osteoinductive

- The high porosity of Ligamed products support initial clot stabilisation.
- Calcium phosphate provides a conductive scaffold for blood vessels and bone stimulating cells - a structure very similar to the mineral component of natural bone.
- Ligamed materials include silicate which increases circulating protein retention giving bioactive characteristics to the graft.



Biodegradable

Biodegradable with Full Resorption. With its optimized porous structure and chemical composition, Ligamed grafts are optimised for bone healing. During the healing process, silicate is adsorbed first followed by the B-TCP scaffold in 4-6 months promoting replacement with native new bone.



Safe, Biocompatible and Sterile

Ligamed grafts are supplied sterile and CE marked as a Class III Medical Device according to 93/42 / EC directive. Biocompatibility (in vitro and in vivo), biodegradation, bioburden and sterility tests are applied to each material.

Radiopaque

CT and X-ray traceability is possible.



For product dimensions and reference numbers, please refer to the product lists at the end of the catalogue.

SILICATE ADDITIVE FLEXIBLE STRIP



Ligamed Flexible Strip is a biodegradable synthetic bone graft that is easy to use due to its high elasticity, especially in bone defects of the pelvis and lower extremities as well as posteriolateral spinal fusion cases. Dental applications include ridge augmentation as an alternative to autogenous bone plates.

Ligamed Flexible Strip consists of silicate-added B-TCP embedded inside a PLA based synthetic polymer lattice of varying thicknesses. Osteoinductive characteristic are achieved through the addition of silicate to the embedded Ligamed graft material.



Ligamed Flexible Strip Implantation;

- Ligamed Flexible Strip can be applied to the surgical area directly or combined with bone marrow aspirate or blood.
- When wetted the flexibility of Ligamed Flexible Strip increases significantly.
- Ligamed Flexible Strip must be implanted just before all metallic implants are stabilized and the surgical site is closed.
- Ligamed Flexible Strip can be cut and placed in the spinal cage.
- Ligamed Flexible Strip gains osteoinductive characteristic due to silicate addition to the product content.

For product dimensions and reference numbers, please refer to the product lists at the end of the catalogue.

SILICATE ADDITIVE PUTTY & DENTAL PUTTY



- Minimally invasive surgical application.
- Quick and easy application. Does not require mixing.
- Accelerates Bone formation.



• Designed for the healthy development of bone and periodontal support tissue.



- Composed of silicate added B-TCP and resorbable cellulose carriers of varying viscosities.
- Ligamed syringe delivered grafts gains osteoinductive properties due to silicate addition.

For product dimensions and reference numbers, please refer to the product lists at the end of the catalogue.

HISTOLOGIES OF DENTAL PUTTY





Fig. 2 Details Section A

- a-f) LDP surrounded by connective tissue. b) Occasionally, Osteoid (O) detectable.
- d-f) Extraordinary amount of multinucleated giant cells (MNGs, Asterisk*) visible.

d-f) LDP appears biphasic (grey and pink)

Background

Male, 25 years old.

Non-smoker.

Non-contributory medical history.

Surgical extraction and immediate grafting of the large 4-wall bone defect with Ligamed Putty.

Case performed by Dr. Minas Leventis, DDs, MSc, Phd, TR

CASE STUDY

1. Initial radiological view.

3. Usage of Ligamed Putty for immediate grafting of the large 4-wall bone defect.

4. Histology of extracted bone



Fig. 3 Details Section B

f) LDP surrounded by connective tissue. Plenty of multinucleated giant cells (MNGs.) visible as-well. b) Many LDP particles demonstrate new bone formation (NB) at the particle surface.

f) LDP appears biphasic (grey and pink). Some particles seem to be in dissolution (arrow ->)

DENTAL BARRIER MEMBRANE

Ligamed Barrier Membrane is:

-Designed for the healthy development of bone and periodontal support tissue.

-Composed of a poly (lactic acid) based synthetic polymer that is biocompatible and resorbable with an excellent safety profile in medical applications.



The three-layered structure of Ligamed Barrier Membrane prevents the migration of epithelial and fibroblast cells, selectively supporting the healthy development of bone and periodental tissues. Ligamed Barrier Membrane preserves its structure for 10-12 weeks and is completely absorb.

Ligamed Barrier Membrane does not contain human or animal tissue, removing any risk of viral or disease transmission as well as complying with the wishes of vegans who avoid animal derived products.

Due to its complete resorption, a second surgery for removal is not required.





Ligamed Barrier Membrane Application

The outer surface of the Ligamed Barrier Membrane, consists of a compressed (non porous) poly (lactic acid) (PLA) layer which is placed next to the soft tissue to exclude epithelial and fibroblast cells from the site.

The inner surface of the Ligamed Barrier Membrane faces the bony surface and consists of porous poly (lactic acid) (PLA) microfibers which induce mesenchymal stem cell retention proliferation and differentiation.

The three-layered barrier membrane is designed for the healthy development of bone and periodontal support tissue.

CHONDRO MATRIX



Ligamed Chondro Matrix is one-step, hydrophilic, sterile, bioresorbable, CE marked, cell-free implant used to treat articular cartilage defects in the knee, ankle or hip. It uses the biological potential of stem cells to potential of stem cells to restore damaged cartilage tissue in the joints.

Ligamed Chondro Matrix is composed of biomedical grade Polylactic Polylactic Acid (PLA) to provide structural support for 1-2 months and sodium hyaluronate (hyaluronic acid) to promote chondrogenesis.

Chondro Matrix does not contain human or animal tissue, removing any risk of viral or disease transmission as well as complying with the wishes of vegans who avoid animal derived products.

Due to its complete resorption, a second surgery for removal is not required.

Used for repair and surgical treatment of pain and limited mobility. When placed next to the damaged area, Chondro Matrix absorbs the accumulated blood and provides optimal defect coverage, induces the formation of cartilage repair tissue, reduces pain and symptoms associated with joint defects, and improves patients' quality of life and mobility.



Chondro Matrix low (a) and high (b) magnification SEM image.

Use of Ligamed Chondro Matrix;

Microfracturing

- Mesenchymal stem cells are obtained by Marrow stimulating procedures, such as microfracturing or Pridie drilling. Preparation and Implantation of Ligamed Chondro Mat
- Ligamed Chondro matrix can be easily trimmed to match the defect.
- Ligamed Chondro matrix is implanted into the defective cartilage by mini-open or keyhole procedure.
- 3 Fixation of Ligamed Chondro Matrix
- Ligamed Chondro matrix can be fixed to the defect by commonly used orthopeadic fixation methods.
- Bioresorbable pins.
- Cartilage suture.
- Fibrin glue.

BONE CEMENT

Polymethyl methacrylate (PMMA) based Bone Cement is a widely used biomaterial due to its ease of use in clinical practice and its long survival rate, especially with prosthetics.

Common indications for using Bone Cement:

Total joint replacement, bone and joint reconstructions, fracture fixation and treatment of osteoporotic vertebral fractures.

- Bone Cement consists of two phases, solid and liquid phases.
- Ligamed Bone Cement it is presented in three different viscosities as low, standard and high.
- Dough and setting times, maximum temperature and mechanical strength values are matched to Internationally recognised ISO 5833 standards.









INTERFERENCE SCREW

Interference screw is a fixation device used to rigidly fix bone-patellar tendon-bone graft both in femoral and tibial tunnels and anterior cruciate ligament (ACL) reconstruction.

- Poly (L-D, Lactide) (70/30) polymer or Poly (L-D, L Lactide) (70-30)+ B-TCP (70/30) composite implants are absorbed in the body and revision surgeries are not needed.
- Used in anterior and posterior cruciate ligament surgery for temporary fixation of tendon bone and soft tissue.
- The interference screw device is supplied sterile and carries Class III Medical Device status according to the CE directive93/42/EC. Biocompatibility, biodegradation, bioburden and sterility tests are applied to each batch to ensure predictable performance.





BIOABSORBABLE FACE LIFTING DEVICE

TRANSBLEPH

- Fast way to achieve upper periorbital region rejuvenation. This device provides versatility to combine upper eyelid skin removal with brow and upper eyelid repositioning in a single surgical session.
- Using the required upper blepharoplasty incision as an entry port, transbleph assists the surgeon in a holistic approach to the upper periorbital region. The device is easy to implement in the field and no extra hardware is required, meaning fewer tools for installation, handling and maintenance.





FOREHEAD

- Optimized size for sensitive applications forehead provides a smaller implant scale with the same predictability and safety for finer local precision applications in the forehead area. It also offers a suitable solution for patients with thicker, soft tissue and forehead skin.
- An ultra-thin platform with multiple ultra-thin spines that are unaffected by palpability but provide sensitivity for patients with all the physical characteristics of the larger Forehead scale.



Forehead

BONE SCRAPER

The Ligarned Bone Scraper is produced from a non toxic polymer. A stainless steel cutter is used to scrape and collect autogenous bone fragments from the chin or ramus area.



The Ligamed Bone Scraper is a disposable device used to collect autogenous bone particles for use in guided bone regeneration procedures.



Bone Scraper Application

The resulting bone fragments provide a high volume due to their curved shape, which significantly reduces the amount of augmentation material required and reduces the invasiveness of the intervention.

Ligamed Scrapers offer the possibility of obtaining both cortical and spongy bone. Manual removal mixes bone fragments directly with patient blood and retains cellular components such as osteocytes for optimal bone regeneration.

TITANIUM PIN SET (GRADE 5)

PROPERTIES

Ergonomically designed for easy capture and quick application of titanium pins. The Ligamed Pin Applicator offers single-handed fixation of resorbable and non-resorbable membranes.

- The ergonomic design of the applicator allows easy removal of the pin and easy fixation of the membrane. The notch, which is approximately half the length of the pin, ensures that the pin engages bone easily.
- The pin head macro geometry allows insertion without bone preparation whilst the head design prevents bending during application. These features result in higher torque insertion, better primary stability, and a more predictable success rate.
- Distortion of the pin apex during handling cannot occur.



CORTICAL PLATE

- The cortical plate consists of synthetic composite materials (PLGA + β -TCP).
- Cortical Plate is used for bone fixation in trauma and reconstructive surgical operations.
- Cortical Plate is bioabsorbable.
- Cortical Plate does not contain human and animal origin tissue or blood derivatives.
- Cortical Plate graft is safe for patients undergoing MRI or CT scans and is biocompatible with human tissue. The shelf life of Cortical Plate is 3 years with sterilisation by ethylene oxide. Cortical Plate carries a CE mark and is produced in a a ISO 13485 Quality Certified facility.







FIXATION SCREW (GRADE 5 TITANIUM)

Indicated for use in Guided Bone Regeneration, fixation of membranes, flexible strips, cortical grafts and meshes.

High stability

The titanium alloy (grade 5) fixation screw provides high stability without weakening of the material thanks to the aggressive structure of the screw.

Biocompatible

The screw material helps to reduce the risk of infection and helps to prevent allergic reactions.









SECTION A-A

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DETAIL B

TOOTH WHITENING SYSTEM (Home Use)

Ligamed Tooth Whitening System (Home Use) is a cosmetic product designed for use in the oral cavity as a tooth whitening agent. The controlled application of the supplied agent lightens the teeth by gentle bleaching of organic pigments within the enamel.

Contents

- 8 x 1,5 g teeth whitening syringes.
- 2 whitening tray.
- Box for whitening tray.

Ingredients: Hydrogen peroxide, glycerol, sodium hydroxide, potassium nitrate, carbomer, aroma.

Ligamed Tooth Whitening System (Home Use) is for at-home application following the advice of a professional.



TOOTH WHITENING SYSTEM (Office Use)

Ligamed Tooth Whitening System Office Use is an oral care cosmetic product used under the supervision of a professional for in office tooth whitening. Ligamed Tooth Whitening System Office Use lightens teeth by removing stains created by organic pigments deep in the dentin tissue.

Contents

- 4 x 0,4 g A syringes + 4 x 1,1 g B syringes.
- 2 x 2,5 g gingival barrier.
- 4 connectors and 6 syringe tips.

Ingredients: Hydrogen peroxide, glycerol, sodium bicarbonate, potassium nitrate, carbomer.



Ligamed Stick, Block & Wedge



Reference Code	Size	Volume
LS44204	4x4x20 mm (4 pcs)	8,10 cc
LS44205	4x4x20 mm (5 pcs)	10,13 cc
LS44206	4x4x20 mm (6 pcs)	12,15 cc
LS55204	5x5x20 mm (4 pcs)	16,50 cc
LS55205	5x5x20 mm (5 pcs)	20,63 cc
LS55206	5x5x20 mm (6 pcs)	24,76 cc
LS55254	5x5x25 mm (4 pcs)	18,80 cc
LS55255	5x5x25 mm (5 pcs)	23,50 cc
LS55256	5x5x25 mm (6 pcs)	25,00 cc
LSC3204	3x20 mm (4 pcs)	7,80 cc
LSC4204	4x20 mm (4 pcs)	10,40 cc
LSC6204	6x20 mm (4 pcs)	15,56 cc
LSC8204	8x20 mm (4 pcs)	20,76 cc
LW082530	8x25x30 mm	7,65 cc
LW102530	10x25x30 mm	10,15 cc
LW122530	12x25x30 mm	15,15 cc
LW142530	14x25x30 mm	20,15 cc

Ligamed Granule



Reference Code	Size	Volume	Reference Code	Size	Volume
LCSGB02501005	0.25-1 mm	0,5cc	LCS020405	2-4 mm	5 cc
LCSGB02501010	0.25-1 mm	1 cc	LCS0204075	2-4 mm	7,50 cc
LCSGB02501020	0.25 - 1 mm	2 cc	LCS020410	2-4 mm	10 cc
LCSGB02501050	0.25 - 1 mm	5 cc	LCS020415	2-4 mm	15 cc
LCSGB02501100	0.25 - 1 mm	10 cc	LCS020420	2-4 mm	20 cc
LCSGB05001005	0.5 - 1 mm	0,5cc	LCS020430	2 - 4 mm	30 cc
LCSGB05001010	0.5 - 1 mm	1 cc	LCS030505	3 - 5 mm	5 cc
LCSGB05001020	0.5 - 1 mm	2 cc	LCS0305075	3 - 5 mm	7,50 cc
LCSGB05001050	0.5 - 1 mm	5 cc	LCS030510	3 - 5 mm	10 cc
LCSGB05001100	0.5 - 1 mm	10 cc	LCS030515	3 - 5 mm	15 cc
LCSGB10002005	1 - 2 mm	0,5cc	LCS030520	3 - 5 mm	20 cc
LCSGB10002010	1-2 mm	1 cc	LCS030530	3-5 mm	30 cc
LCSGB10002020	1 - 2 mm	2 cc	LCS040705	4-7 mm	5 cc
LCSGB10002050	1-2 mm	5 cc	LCS0407075	4-7 mm	7,50 cc
LCSGB10002100	1-2 mm	10 cc	LCS040710	4-7 mm	10 cc
			LCS040715	4 - 7 mm	15 cc
			LCS040720	4-7 mm	20 cc
			LCS040730	4-7 mm	30 cc

Ligamed Putty



Reference Code	Volume
LPS005	0,5 cc
LPS01	1 cc
LPS015	1,5 cc
LPS02	2 cc
LPS03	3 cc
LPS05	5 cc
LPS075	7,5 cc
LPS10	10 cc

Ligamed Dental Putty



Reference Code	Volume
LDP050	0,5 cc
LDP100	1 cc
LDP150	1,5 cc
LDP200	2 cc
LDP500	5 cc

Ligamed Flex



Reference Code	Size	Volume	Reference Code	Size	Volume
LFS25254	25x25x4mm	2,50 cc	LFS50754	50x75x4mm	15,00 cc
LFS25504	25x50x4mm	5,00 cc	LFS60505	60x50x5mm	15,00 cc
LFS30306	30x30x6mm	5,40 cc	LFS251006	25x100x6mm	15,00 cc
LFS25505	25x50x5mm	6,25 cc	LFS75405	75x40x5mm	15,00 cc
LFS25506	25x50x6mm	7,50 cc	LFS251008	25x100x8mm	20,00 cc
LFS25754	25x75x4mm	7,50 cc	LFS501004	50x100x4mm	20,00 cc
LFS25804	25x80x4mm	8,00 cc	LFS60606	60x60x6mm	21,60 cc
LFS201004	20x100x4mm	8,00 cc	LFS45806	45x80x6mm	21,60 cc
LFS25508	25x50x8mm	10,00 cc	LFS50756	50x75x6mm	22,50 cc
LFS25805	25x80x5mm	10,00 cc	LFS501006	50x100x6mm	30,00 cc
LFS50504	50x50x4mm	10,00 cc	LFS751004	75x100x4mm	30,00 cc
LFS201005	20x100x5mm	10,00 cc	LFS701104	70x110x4mm	30,00 cc
LFS251004	25x100x4mm	10,00 cc	LFS25252	25x25x2mm	
LFS35605	35x60x5mm	10,50 cc	LFS25502	25x50x2mm	
LFS25806	25x80x6mm	12,00 cc	LFS25503	25x50x3mm	
LFS60504	60x50x4mm	12,00 cc	LFS25802	25x80x2mm	
LFS201006	20x100x6mm	12,00 cc	LFS35602	35x60x2mm	
LFS251005	25x100x5mm	12,50 cc	LFS201002	20x100x2mm	
LFS35606	35x60x6mm	12,60 cc			
LFS50506	50x50x6mm	15,00 cc			
LFS50754	50x75x4mm	15,00 cc			
LFS60505	60x50x5mm	15,00 cc			

Ligamed Barrier Membrane

Ligamed Chondro Matrix



Reference Code	Size
LM1520	15x20 mm
LM1525	15x25 mm
LM2020	20x20 mm
LM2025	20x25 mm
LM2530	25x30 mm
LM2030	20x30 mm
LM2530	20x30 mm
LM3040	30x40 mm
LM1520-5	15x20 mm (5pcs)
LM1525-5	15x25 mm (5pcs)
LM2020-5	20x20mm (5pcs)
LM2030-5	20x30mm (5pcs)



Reference Code	Size
LK202011	20-20-1,1 mm
LK203011	20-30-1,1 mm
LK251711	25-17-1,1 mm
LK252511	25-25-1,1 mm
LK253511	25-35-1,1 mm
LK353511	35-35-1,1 mm

Ligamed Bone Cement



Reference Code	Size
LVC-LV-20	$20 \ g$ (LV Radiopaque Vertebroplasty Bone Cement)
LVC-LV-40	$40 g ({\sf LV Radiopaque Vertebroplasty Bone Cement})$
LKC-LV-20	20 g (LV Radiopaque Kyphoplasty Bone Cement)
LKC-LV-40	40~g~(LV Radiopaque Kyphoplasty Bone Cement)
LOC-SV40	40 g (SV Radiopaque Orthopedics Bone Cement)
S-LC-HV20	20 g (HV Radiopaque Bone Cement)

Ligamed PLDLLA+TCP 30 Interference Screws



Reference Code	Size
SCRW-LPT30IS720	7 mm x 20 mm
SCRW-LPT30IS725	7 mm x 25 mm
SCRW-LPT30IS730	7 mm x 30 mm
SCRW-LPT30IS820	8 mm x 20 mm
SCRW-LPT30IS825	8 mm x 25 mm
SCRW-LPT30IS830	8 mm x 30 mm
SCRW-LPT30IS835	8 mm x 35 mm
SCRW-LPT30IS920	9 mm x 20 mm
SCRW-LPT30IS925	9 mm x 25 mm
SCRW-LPT30IS930	9 mm x 30 mm
SCRW-LPT30IS935	9 mm x 35 mm
SCRW-LPT30IS1025	10 mm x 25 mm
SCRW-LPT30IS1030	10 mm x 30 mm
SCRW-LPT30IS1035	10 mm x 35 mm
SCRW-LPT30IS1135	11 mm x 35 mm
SCRW-LPT30IS1230	12 mm x 30 mm

Ligamed PLA Interference Screws



Reference Code	Size
SCRW-LPIS720	7 mm x 20 mm
SCRW-LPIS725	7 mm x 25 mm
SCRW-LPIS730	7 mm x 30 mm
SCRW-LPIS820	8 mm x 20 mm
SCRW-LPIS825	8 mm x 25 mm
SCRW-LPIS830	8 mm x 30 mm
SCRW-LPIS920	9 mm x 20 mm
SCRW-LPIS925	9 mm x 25 mm
SCRW-LPIS930	9 mm x 30 mm
SCRW-LPIS1020	10 mm x 20 mm
SCRW-LPIS1025	10 mm x 25 mm
SCRW-LPIS1030	10 mm x 30 mm

Ligamed TRANSBLEPH Device



Reference Code	Size
C-EST-LTD30	3,0 mm (height of pins)
C-EST-LTD35	3.5 mm (height of pins)

Ligamed FOREHEAD Lift Device



Reference Code	Size
C-EST-LFLD30	3,0 mm (height of pins)
C-EST-LFLD35	3,5 mm (height of pins)

Bone Scraper



Titanium Pin Set (Grade5)



Reference Code Liga-398.0002530 Liga-398.0002550 Size 2.5x3,00 mm 2.5x5,00 mm

Cortical Plate



Reference Code	Size
C-PLT-L219HPS115	25x10x1 mm



aggresive model

Reference Code	Size
Liga-TPSS	6,80 mm
Liga-TPSL	8,80 mm
Liga-TPSM	10,80 mm
Liga-TPSK	12,80 mm



passive model

Reference Code	Size
Liga-TPSS	7 mm
Liga-TPSL	10 mm
Liga-TPSM	13 mm



Reference Code LWA06-01 (Office Use) LIGAMED Tooth Whitening System 35 % HP



Reference Code

LPWA35-01



Head Office : Site Mah. Baha Sok. Koza Palace No: 2 / 3 P.C. 34760 Ümraniye, İSTANBUL / TÜRKİYE

Branch Office : 7410 Sokak No:8 Kemalpaşa Mahallesi PINARBAŞI-BORNOVA / İZMİR / TÜRKİYE



Factory : Keçiliköy OSB Mahallesi İsmail Kahraman Cad. No:1/1/A YUNUSEMRE / MANİSA / TÜRKİYE - P.C.45030

Phone: +90 216 594 57 21-31 Fax: +90 216 594 57 71

www.ligamed.com.tr info@ligamed.com.tr